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BY SIR WILLIAM HALE-WHITE, K.B.E.,
M.D. LOND. & DUB., LL.D. EDIN.,
CONSULTING PHYSICIAN TO GUY'S HOSPITAL.

THERE are two reasons why Harvey should be placed in the select class of really great men. One is because he discovered that the blood circulates, being compelled to do so by the contraction of the heart; the other, even more powerful, is because he was among the earlier scientists to show the value of properly conducted experiment.

Every man's mind is compounded of what is born within him, modified by impressions received from without. Therefore it is of interest to see who were the men around Harvey who might have influenced him. At Padua there were his teachers; many Harveian orators have dealt with this part of his life, but I propose to see if any of his own countrymen, perhaps without his knowledge, can have helped to mould such of his thoughts as led to his great discovery. I shall make many quotations, but this, I trust, you will pardon, first, because, in any argument it is necessary that the premises should be precise; secondly, because the language of Bacon is like music to the ear.

Inasmuch as Harvey and Francis Bacon—commonly called Lord Bacon, which is altogether wrong, for his titles were Baron Verulam of Verulam and Viscount St. Alban—were contemporaries, we must consider whether it is likely that he swayed Harvey. The life of Bacon is a fascinating story, but lack of time forbids my saying anything about it which is not germane to my purpose.

THE ADVANCEMENT OF LEARNING.

Harvey published his discovery of the circulation of the blood in 1628, and tells us that he had, for nine years and more, in his lectures, confirmed "these views by multiplied demonstrations in your presence, illustrated them by arguments, and freed them from the objections of the most learned and skilful anatomists." His first mention of it is in his notebook dated 1616. "The Two Bookes of Francis Bacon of the Proficience and Advancement of Learning Divine and Humane," were first published in 1605, when Harvey was 27 years old, 23 years before the publication of his book and several years before he made his discovery. "The Advancement of Learning," "the first great book in English prose of secular interest" (Church), had many readers, for three editions quickly appeared. When his "Instauratio" was issued Bacon sent the King a copy, with a letter saying he thinks it will find many readers "because I hear my former book of the *Advancement of Learning* is well tasted in the Universities here, and the English Colleges abroad; and this is the same argument sunk deeper." [1] The "Advancement," which we thus see was widely read in the years immediately following its publication, implores those who wish to delve into the secrets of nature to discountenance mere authority and not blindly to believe what they are told, but to seek knowledge for themselves by observation and experiment; it teaches how properly to use induction, it points out the hopelessness of the false methods of reasoning commonly used, it has much in it about medicine. It is a noble work, devoted to the lofty purpose of increasing knowledge, its language is so beautiful and dignified that it may be placed second to that of Shakespeare.

The first book contains an oblation to James I., because Bacon longed to persuade the King to be interested in learning. In this he failed, as he had with Elizabeth.

Passing to the second book I will, by direct quotation,[2] try to convince you that the "Advancement of Learning," so immediately popular that Harvey must have known of it, would have appealed to him. Much of the argument is directed to show that a reform of method in the pursuit of knowledge is necessary. Thus:

"For as things are now, if an untruth in nature be once on foot, what by reason of the neglect of examination and countenance of antiquity, and what by reason of the use of the opinion in similitudes and ornaments of speech, it is never called down." [3]

"For the handling of final causes mixed with the rest in physical inquiries, hath intercepted the severe and diligent inquiry of all real and physical causes . . . . to the great arrest and prejudice of further discovery . . . . and have brought this to pass that the search for Physical Causes hath been neglected and passed in silence." [4]

"It being the nature of the mind of man (to the extreme prejudice of knowledge) to delight in the spacious liberty of generalities and not in the enclosures of particularity." [5]

"Where there is much controversy there is at many times little enquiry." [6]

"They hastened to their theories and dogmaticals and were imperious and scornful towards particulars." [7]

Next listen to a few quotations illustrating Bacon's plea for the experimental method:

"I find some collections made . . . . but commonly with a rejection of experiments familiar and vulgar. For it is esteemed a kind of dishonour unto learning to descend to inquiry upon matters mechanical" [8] (or as we should say now-a-days, experimental).

"All true and fruitful Natural Philosophy hath a double scale or ladder, ascendent and descendent; ascending from experiments to the invention of causes and descending from causes to the invention of new experiments." [9]

"Those experiments be not esteemed which have an immediate and present use, but those principally which are of most universal consequence for invention of other experiments,[10] the use of History Mechanical" (i.e., experimental) "is of all others the most radical and fundamental towards natural philosophy." [11]

Then there is a fine passage emphasising the value of experiment, too long to quote in full, it begins:

"But here was their chief error; they charged the deceit upon the senses, which in my judgment are very sufficient to certify and report truth, though not always immediately, yet by comparison, by the help of instrument." [12]

Nowadays, it is at last recognised that those who spend their lives investigating Nature should be paid. Bacon anticipated us, saying—

"There will hardly be any main proficience in the disclosing of Nature, except there be some allowance for expenses about experiments . . . . and therefore as secretaries and spials of princes and states bring in bills for intelligence, so you must allow the spials and intelligencers of Nature to bring in their bills, or else you shall be ill advertised." [13]

The "Advancement" tells us that medicine "is a most noble art," its object being "to tune this curious harp of man's body and reduce it to harmony." The author pities the physician for he is judged by the event—

"which is ever but as it is taken; for who can tell if a patient die or recover . . . . whether it be art or accident? And therefore many times the impostor is prized and the man of virtue taxed. Nay we see the weakness and credulity of man is such, as they will often prefer a mountebank or witch before a learned physician." [14] Consequently physicians say to themselves: "If it befall me as befalleth to the fools, why should I labour to be more wise." [15]

Bacon criticises the doctors of the day quite fairly; he finds that comparative anatomy, physiology, and morbid anatomy are not studied as they should be, that no use is made of vivisection, and that if—

"a man look into their prescripts and ministrations, and he shall find them but inconstances and every day devices without any settled providence or project." [16]

His attitude to medicine is shown in the sentence:

"There is one thing still remaining which is of more consequence than all the rest—namely, a true and active Natural Philosophy for the science of Medicine to be built upon" [17]

and his attitude to science may be summed up in two sentences:

"And this is the very thing which I am preparing and labouring at with all my might, to make the mind of man

by help of art, a match for the nature of things [18] . . . . when he uses some direction and order in experimenting, it is as if he were led by the hand." [19]

Surely, after these extracts, we must believe that Bacon's own physician, Harvey, was influenced by his patient's book which was widely known, was published some years before Harvey began his researches, contains much about medicine and preaches reform of method and the use of experiment, in both of which Harvey's strength lay. I do not like to think that he was so ill-educated as not to have followed Shakespeare and other learned people in the reading of the "Advancement," by the author of the already popular Essays, for his contemporary, Ben Jonson, in a review of the great English writers, says of him "he who hath filled up all numbers, and performed that, in our tongue may be compared or preferred either to insolent Greece or to haughty Rome," [20] and in these days we have Abbott speaking of Bacon's unique mastery of the English language. Remember, these words are said of a man writing at the time of Shakespeare and the Authorised Version, and then we get a measure of Bacon's greatness as a writer.

Another work of Bacon's that must have been known to Harvey, before the making of his discovery, is "De Sapientia Veterum," issued in 1609; it was much appreciated and was soon reprinted and translated. Its general trend is welcome to a man well disposed towards experiment, for the proper investigation of Nature is recommended in it.

THE NOVUM ORGANUM.

In 1620 a book was published which began thus:

"*The Great Instauration. Pro-œmium.* Francis of Verulam reasoned thus with himself and judged it to be for the interest of the present and future generations that they should be made acquainted with his thoughts." [21]

He tells us that the human intellect makes its own difficulties, and hence ignorance and mischiefs innumerable. Therefore the author is "to commence a total reconstruction of sciences, arts and all human knowledge." [22] Lest he should die before the work is finished, it was to be published in six parts. The first, which appeared after the second, was "De Augmentis." The second, issued in 1620, was the "Novum Organum," not quite completed. Only fragments of some of the other parts were ever written; Bacon calculated that his work when finished would be sixfold as voluminous as Pliny. If this estimate is correct we only have one-twentieth of the whole.

The "Novum Organum" has all the beauties of the "Advancement"; it is a masterpiece of condensed writing, without a word too many, and each word precisely right. As with the "Advancement," I will give extracts which will show that it also is just such a book as would help to form a mind like Harvey's. In the "Plan" introducing us to the "Novum Organum" we find this:

"The subtlety of experiments is far greater than that of the sense itself. I contrive that the office of the sense shall be only to judge of the experiment and that the experiment shall judge of the thing." [23]

"Those, however, who aspire not to guess and divine, but to discover and know; who propose not to devise, and mimic fabulous worlds of their own, but to examine and dissect the nature of this very world itself; must go to facts themselves for everything." [24]

In the preface is this eloquent exhortation:

"But if any man there be who . . . . aspires to penetrate further; to overcome, not an adversary in argument, but nature in action; to seek, not petty and probable conjectures but certain and demonstrable knowledge with me, that passing by the outer courts of nature which numbers have trodden, we may find a way at length into her inner chambers." [25]

In the "Novum Organum" itself we are warned not to pin our faith to the syllogism, for the premisses being only words, often there is no firmness in the superstructure, our only hope lies in a true induction; we are reminded that we can only progress by the study of particulars. We are told that—

"it is the peculiar and perpetual error of the human intellect to be more moved and excited by affirmatives than negatives; whereas it ought properly to hold itself indifferently disposed towards both alike." [26]

"What a man had rather were true he more readily believes." [27]

We suffer from "the mischievous authorities of systems, which are founded either on common notions or on a few experiments or on superstition." [28]

Then follows advice to physicians to renounce all varieties of false reasoning, for—

"the entrance into the kingdom of man, founded on the sciences, being not much other than the entrance into the Kingdom of Heaven, whereunto none may enter except as a little child." [29]

"The manner of making experiments which men now use is blind and stupid." [30]

"Men are inclined to turn aside from their experiments for some practical application of them, like Atalanta, they go aside to pick up the golden apple and let victory escape them, they should seek for experiments of light, not for experiments of fruit." [31]

A few pages further on we find this beautiful passage:—

"And an astonishing thing it is to one who rightly considers the matter, that no mortal should have seriously applied himself to the opening and laying out of a road for the human understanding direct from the sense, by a course of experiment orderly conducted and well built up; but that all has been left either to the mist of tradition, or the whirl and eddy of argument, or the fluctuations and mazes of chance and of vague and ill-digested experience." [32]

"No one has yet been found so firm of mind and purpose as resolutely to compel himself to sweep away all theories and common notions and to apply the understanding thus made fair and even, to a fresh examination of particulars." [33]

"A greater abundance of experiments is to be sought for and procured." [34]

Then, to magnify the dignity of investigation, Bacon quotes the proverb of Solomon:

"The glory of God is to conceal a thing; the glory of the king is to search it out." [35]

Bound up with the first edition of the "Novum Organum," Bacon published a "Description of a Natural and Experimental History such as may serve for the foundation of a True Philosophy." The introduction contains some of his most magnificent writing. Listen to this from it:—

"Meanwhile what I have often said I must here emphatically repeat; that if all the wits of all the ages had met or shall hereafter meet together; if the whole human race had applied or shall hereafter apply themselves to Philosophy, and the whole earth had been or shall be nothing but academies and colleges and schools of learned men; still without a natural and experimental history such as I am going to prescribe, no progress worthy of the human race could have been made in or can be made in philosophy and the sciences. Whereas, on the other hand, let such a history be once provided and well set forth, and let there be added to it such auxiliary and light giving experiments as in the very course of interpretation will present themselves . . . . For in this way and in this way only, can the foundations of a true and active philosophy be established; and then will men wake as from a deep sleep, and at once perceive what a difference there is between the dogmas and figments of the wit and a true and active philosophy, and what it is in questions of nature to consult nature herself." [36]

One more quotation from the same source I cannot resist:

"Away with antiquities and citations or testimonies of authors." [37]

WAS HARVEY INDEBTED TO THE "NOVUM ORGANUM"?

But some may say all this is beside the mark, for, before these two books appeared in 1620, Harvey, for about four years, had been teaching that the blood circulates. Thus, in a leading article in the *British Medical Journal*, we find "a comparison of dates shows that Harvey could not owe anything to the "Novum Organum." [38] On the face of it this appears a fair inference, but it is probably incorrect because of the following considerations. The most trustworthy

account we have of Bacon is that by his chaplain, Rawley, who says:

"His book of the *Instauratio Magna* . . . . was the production of many years' labour and travel. I myself have seen at least 12 copies of the *Instauration* revised year by year one after another, and every year altered and amended in the frame thereof, till at last it came to that model in which it was committed to the press . . . . he would often ask if the meaning was expressed plainly enough." [39]

Further, many tracts, which are trials for the great book, were found among Bacon's papers after his death. Some were written as early as 1603–1605. I need not name them as they can all be found in "The Works of Francis Bacon." A quotation from the "Cogitationes" will suffice:

"And it were shame that men should have examined so carefully the tinklings of their own voice and should yet be so ignorant of the voice of nature." [40]

We see, therefore, that for many years before the publication of the "Novum Organum," and before Harvey began his experiments, Bacon's mind was much occupied with it, that he worked hard at it, making numerous trials; he certainly talked about it with his chaplain, consequently it is likely that he talked about it with his physician, of whom, as we shall see presently, he probably saw much, for there was no secret about Bacon's philsoophical work; he invited criticism from several friends; many had already read the "Advancement" published earlier; he often spoke of his desire to study; it was well known how he busied himself in his leisure. We can hardly err if we conclude that not only the thoughts expressed in the "Advancement," which we have seen Harvey had ample opportunity of reading before he began his experiments, but also those which simmered in Bacon's brain between the publication of this work and that of the "Novum Organum," in which they were embodied, were known to and affected Harvey, to whom they would have been particularly congenial, for he became one of the greatest of discoverers because he experimented and disregarded mere authority.

EFFECT ON SCIENCE OF BACON'S TEACHING.

If I have carried you in unison with me so far, you are with me in thinking that Bacon's teaching touched the mind of Harvey; still, it will be an advantage to see if this opinion is strengthened by what others have thought of the position of Bacon's writings in the history of science. Aristotle and Leonardo da Vinci had experimented; several others, such as Albert the Great, Vanini, Campanelle, and Ramon Lull, as may be seen in Prof. E. A. Peers's recent translation of Blanquerna,[41] saw that mere authority was allowed to override reason. Roger Bacon had laid down precepts that might have guided men aright, but, so abstract and dogmatic was the ordinary teaching up to the time of Francis Bacon, that these examples bore little fruit, being stifled under the mass of theological, metaphysical and commentatorial literature with which the Middle Ages abounded. It was Francis Bacon who caused this deadening fog, which bemused all originality, to roll back when he directed men to discard authority and to seek out nature by proper observation, proper reasoning, and proper experiment. People of his own time saw this. Rawley says: "If there was a beam of knowledge derived from God upon any man in these modern times, it was upon him."[42] Peter Heylen, who was a young man when the Great "Instauration" was first published, tells us—

"The Lord Chancellor Bacon was a man of most strong Brain and a chymical Head . . . . Pity it was, he was not entertained with some liberal salary, abstracted from all Affairs both of Court and Judicature, and furnished with sufficiency both of Means and Helps for the going on of his Design. Which had it been, he might have given us such a body of Natural Philosophy, and made it so subservient to the public good, that neither Aristotle, nor Theophrastus amongst the ancients, nor Paracelsus or the rest of our latter chymists would have been considerable." [43]

Sprat writes:

"I shall only mention one Great Man who had the true imagination of the whole extent of this Enterprise, as it is now set on foot; and that is, the Lord Bacon . . . . His Genius was searching and inimitable." [44]

The enterprise was the foundation of the Royal Society, and it is generally allowed that it was Bacon's "New Atlantis" and the thoughts inspired in others by him which led to the foundation of not only the Royal Society, but also of several foreign scientific associations. Metaphysical Cowley in his poem to this Society writes thus:

"Bacon, like Moses, led us forth at last,
The barren Wilderness he past,
Did on the very Border stand
Of the blest promis'd Land,
And, from the Mountain's top of his exalted Wit,
Saw it himself and showed us it." [45]

So much for the past opinion of Bacon's influence. During three centuries it has remained unchanged. We find Leibnitz [46] remarking—

"We do well to think highly of Verulam for his hard sayings have a deep meaning in them."

Whewell [47] mentions no other author in his preface and begins his book with a quotation from Bacon, and Macaulay writes that Bacon "moved the intellects which moved the world." Space allows me to quote only two modern writers. Prof. Thomas Fowler [48] tells us—

"What Bacon says of Plato is pre-eminently true of himself, he was 'a man of a sublime genius who took a view of everything as from a high rock.'"

He popularised and dignified experimentation and the study of nature.

"It would hardly, I think, be an exaggeration to compare Bacon in the intellectual sphere, with Luther in the sphere of religion."

Church [49] writes that Bacon—

"had the brightest, richest, largest mind but one, in the age which had seen Shakespeare and his fellows."

Later on he says:

"in temper, in honesty, in labour, in humility, in reverence he was the most perfect example that the world had yet seen of the student of nature, the enthusiast for knowledge."

In the introduction to Fowler's edition of the "Novum Organum" will be found a long list of testimonies by many writers to the extraordinary power that Bacon's teaching has had upon scientific thought and production. The chief claim that Bacon made for himself is quaintly expressed in the letter he wrote to Dr. Playfer:

"I have only taken upon me to ring a bell to call other wits together, (which is the meanest office) it cannot but be consonant to my desire, to have the bell heard as far as can be." [50]

Truly its peal has been heard all over the world and has reverberated for three centuries, and surely these references suggest that Harvey must have heard its call.

BACON'S PERSONALITY.

Having shown that Bacon's teaching was available to Harvey, was well known while he was a young man, and would be attractive to him, let us see whether the last is true also of Bacon's personality. Nobody is more likely to know him well than his secretary, Meautys, and his chaplain, Rawley. Both were devoted to him, and the first says his sole ambition is to grow up only under his Lordship and come what may to serve him with his life and fortune, laying down all he has at his feet.[51] The second shows us that Bacon must have been a delightful conversational companion.

"His meals were refections of the ear as well as of the stomach . . . . wherein a man might be refreshed in his mind and understanding no less than in his body . . . . In which conversations . . . . he was no dashing man, as some men are, but ever a countenancer and fosterer of another man's parts. Neither was he one that would appropriate the speech wholly to himself, or delight to outvie others, but leave a liberty to the co-assessors to take their turns." [52]

Tobie Mathew, son of the Archbishop of York, says of Bacon—

"It is not his greatness I admire, but his virtue. It is not the favours I have received of him that have enthralled and enchained my heart, but his whole life and character; which are such, that, if he were of an inferior condition, I could not honour him the less, and if he were my enemy I should not the less love and endeavour to serve him." [52]

Ben Jonson tells lovingly of his virtue and thus of his speech—

"No man ever spake more neatly, more pressly, more weightily; or suffered less emptiness, less idleness, in what he uttered . . . . No man had their affections more in his power. The fear of every man that heard him was, lest he should make an end." [54]

His secretary and apothecary, Boener, hoped that a statue of him would be put up, not because of his learning, but on account of his being "a memorable example to all of virtue, kindness, peacefulness and patience." [55]

We know a man by his friends. Bacon drew them from everywhere. There were many abroad and in this country Essex, Buckingham, Lancelot Andrewes, Selden, Bodley, Hobbes, Jonson, Mathew and George Herbert the poet who helped in the translation of the "Advancement" into Latin and who wrote verses in praise of Bacon who in his turn dedicated his versification of the Psalms to Herbert saying he was his affectionate friend. Bacon had few enemies, the chief was Coke, his professional antagonist. He was popular, as we learn from the fact that when he took his seat as Lord Keeper, besides the servants, the Judges and the Inns of Court, he was accompanied by most of the nobility, with other gallants to the number of 200 horse.

All this shows him to have been a lovable charming person with whom everybody would enjoy talking, and it is incredible that his physician did not converse with him and that he was ignorant of his teaching.

BACON'S HEALTH.

On the whole, Bacon's health was good; nevertheless he was a chronic dyspeptic, giving considerable thought to his symptoms and indulging abundantly in aperients. He has left us very particular accounts of how he took these and how they acted. [56]

In 1617 he had an illness thought to be gout, but it only lasted a few days. A contemporary letter [57] says, "he hath so tender a constitution both of body and mind that he will hardly be able to undergo the burden of so much business." This surmise was incorrect, for during the next four years Bacon worked very hard. Two years later he was away from work for a time probably owing to an attack of stone "which held him in great pain two or three days." [58] That he was very fond of taking medicine is shown by these and other references and by a letter written in 1623, which is of interest as having to do with the separation of the Company of Potycaries from that of Grocers; in it he says, "You may perhaps think me partial to Potycaries, that have been ever puddering in physic all my life." [59]

Bacon depended on his physician. When he was let out of the Tower he was not allowed to come within the verge of the Court, and thus he could not live in London. In some moods he thought the Tower preferable to such liberty, for he wrote in his petition to the House of Lords, "there I could have company, physitians," and he said the same in two letters to Buckingham, to whom, in a letter two years later, he again speaks of his physicians, whom he calls strange creatures. It is difficult to conceive a patient more likely to consult his physician frequently than one who was a chronic introspective dyspeptic, rejoiced in purgatives, had gout and a stone, especially as we have just seen that this patient was one with whom the physician would have delighted to talk, and many statements in Sylva Sylvarum suggest that Bacon often discoursed with doctors.

Further, apart from the relationship of patient and physician, Bacon and Harvey must have seen much of each other, for London was no bigger than a large provincial town of the present time, both moved among the Court and nobility and both were in the small class of the well educated.

HARVEY'S MIND SIMILAR TO BACON'S.

I have now finished with what may be called the Baconian side of my argument. The Harveian side will be much shorter. The philosopher said observe and experiment properly, deduce scientifically, without attention to mere authority; no one could have done this more rigorously than the physician, whose mind was in this matter the counterpart of that of the philosopher, for Harvey said to Ent—

"I have oftentimes wondered and even laughed at those who have fancied that everything had been so consummately and absolutely investigated by an Aristotle or a Galen or some other mighty name that nothing could by any possibility be added to their knowledge." [60]

In the introduction to his work on the "Generation of Animals," he writes:

"Without the due admonition of the senses, without frequent observation and reiterated experiment, our mind goes astray after phantoms and appearances."

Further on:

"The method of investigating truth commonly pursued at this time therefore is to be held erroneous and almost foolish, in which so many inquire what others have said, and omit to ask whether the things themselves be actually so or not."

Or to take a passage from the introduction to "De Motu":

"It will be proper to look more narrowly into the matter; to contemplate the motion of the heart and arteries, not only in man, but in all animals that have hearts; and further, by frequent appeals to vivisection, and constant ocular inspection, to investigate and endeavour to find out truth."

Really, except that the language has not the mighty grandeur of that of Bacon, it might be he writing. So do the minds of Bacon and Harvey jump together that we are constrained to believe that the elder influenced the younger, particularly when we recollect the other reasons already given for this belief.

VALUE OF EVIDENCE THAT HARVEY WAS NOT INFLUENCED BY BACON.

The view here put forward of the relationship between them is not that held by many writers, several of whom speak of Harvey's contempt for Bacon, or state that he can owe nothing to him. Those who maintain the last have forgotten the "Advancement" and the history of the "Novum Organum." All who profess the first base it on the following. Aubrey [61] tells us—

"He (Harvey) had been physitian to the Lord Chancellor Bacon, whom he esteemed much for his witt and style, but would not allow him to be a great philosopher. 'He writes philosophy like a Lord Chancellor' said he to me, speaking in derision; 'I have cured him.'"

Assuredly this anecdote does not justify the belief that Harvey was not affected by Bacon. Aubrey tells us that it was not until 1651 that he became acquainted with Harvey, who was then 73 years old. Aubrey's statement is probably muddled for, as Bacon had been dead 25 years, Harvey most likely said "he wrote" and for the same reason should have said "I cured him," and Aubrey does not make it clear whether Bacon was cured of a bodily ailment or of writing philosophy like a Lord Chancellor. Harvey, who according to Aubrey was very cholerique and was certainly aged, was speaking of a patient dead 25 years before and, being cholerique, may easily, for mere argument's sake, have taken the other side to Aubrey in not allowing Bacon to be a great philosopher, and we must also remember that even if this were Harvey's deliberate opinion, others have thought so too, but have, nevertheless, considered that Bacon did more than anyone to point the way to the proper mode of scientific research. We only have Aubrey's statement that Harvey spoke in derision of Bacon's way of writing, but even if he did, he can only have meant

that Bacon wrote in a stately, dignified, perhaps rather pontifical way; if he meant anything else he was very foolish, for, as already shown, it was allowed when Bacon was alive, and has been ever since, that few can match his prose. Certainly there is nothing in this story to suggest that Bacon did not influence Harvey; indeed, it is the other way, for he must have read the philosopher before he could give an opinion as to how he wrote, and we are told he esteemed his wisdom and style.

But quite apart from this argument there is another reason why we should not pay any attention to this anecdote—namely, that Aubrey is quite unreliable. He did not begin his "Lives" till 1680, when he put each name in a book, then under it, when anything came into his head, he wrote hastily, without reference to notes, his recollections of the person; this was usually done in the morning, often in the midst of sickness following a night's drunken debauch and rarely revised. Harvey had been dead 23 years when this oft-quoted tale of what he said about Bacon, who had been dead 50 years, was jotted down in this manner by a gossiping drunkard, who owns that he wrote "tumultuarily." Look at it as we may, it is worthless as evidence as to what sway Bacon had over Harvey. Indeed Andrew Clark, Aubrey's editor, says "Aubrey's 'Lives' supply an inviting field for comment, correction and addition. But, even so treated, they will never be a biographical dictionary. Their value lies not in statement of biographical or other facts." [62]

It has been implied that, because Harvey is nowhere mentioned by Bacon, we may infer that the two were not in accord. In a note-book of Bacon's under the date July 26th, 1608, he says he must ask for opinions about his scientific work from the physicians Poe, Paddy, and Hamond, but there is nothing to show that he ever did this. He would hardly have asked Harvey for he was then only 30 years old and probably was, at that time, unknown to Bacon.[63] I have looked through everything he wrote, and it is clear that he was interested chiefly in physical science, especially astronomy, but hardly at all in physiology. Many phrases having a physiological bearing are to be found in his writings, but they are all curious isolated statements, if an explanation of them is given it is not Bacon's he merely reproduces the popular explanation. He collected hundreds of these statements for future investigation. Most we now know to be fantastic nonsense.

"De Motu" was published in 1628; Bacon died in 1626. Therefore he could not have alluded to the book. Harvey in his Lumleian lectures began to teach his new views not earlier than 1616. But there is no evidence that Bacon was ever present at these lectures; indeed, from 1616 to 1620 he was at the very busiest part of his career, and he certainly had no time then to attend lectures or to pay much attention to rumours which might come to him saying that a great discovery had been made, especially as Harvey's experiments were then unconfirmed; indeed, if Bacon had asked doctors he would probably have been told that the new doctrines were nonsensical, for we know that many of the medical profession did not think Harvey's views worthy of discussion. So far from its being surprising that there is nothing in the "Novum Organum," published in 1620, about Harvey's discovery which he began to teach, but only orally, some four years before, it would have been astonishing if there had been anything.

In "The History of Life and Death," published in 1623, Bacon says, "the blood is that which irrigates the juices and membranes" and "the blood of the veins supplies the blood of the arteries." [64] It might be thought that these sentences show that he knew something of the circulation of the blood, but my strong opinion, judging by the context, is that he still knew nothing about it. Nor is this to be wondered at, for Bacon, after his release from the Tower in 1621, lived a lonely life away from London, and so would not hear of Harvey's lectures. To sum up, the neglect of Bacon to mention Harvey is easily explained, and is of no value as indicating that the two were antipathetical.

It may be said that I have brought forward no direct proof of any influence of Bacon on Harvey; all my evidence is circumstantial. But two things are to be remembered: first, circumstantial evidence is often much stronger than direct; secondly, how little we know of the daily doings of people who lived 300 years ago. Over and over again there is a reference in a letter to something Bacon had on hand, but of the outcome of which we are completely ignorant. Spedding writes:—

> "It is singular that of two men so remarkable in their several ways as Bacon and Coke, whose fortunes, objects, tastes, ideas, and dispositions crossed each other at so many points, and whose business must have brought them so continually into company and so frequently into conflict, the personal relations should be so little known. No anecdotes have been preserved by the news writers of the day which enable us to form a clear idea of their behaviour to each other when they met,—the style of their conversation, or the temper of their courtesies." [65]

This being so, it is not strange that we have no direct proof of Bacon's influence upon Harvey.

GILBERT'S INFLUENCE.

Everything goes to show that Harvey was regarded with affection by his own profession. He speaks of his "very dear friend Dr. Argent," we know of Ent's tenderness for and admiration of him, of Prujean's esteem for him. His generosity to this College tells us that the Fellows of it were his friends whom he much loved, but there is no indication that among these medical friends there was anyone of sufficient originality to help to mould Harvey's thoughts, with a single exception, namely, William Gilbert, one of the great original geniuses among the famous Elizabethans.

He was born in 1540 at Colchester, went to Cambridge, took his M.D. there, became a Fellow of St. John's, travelled abroad, settled to practise in London in 1573, ultimately living in Wingfield House, Peter's Hill. Sylvanus Thompson's [66] statement that his relations with English physicians were intimate and extensive must be correct, for Gilbert held several offices at this College, becoming President in 1600. He was well known outside his profession, for he attended many celebrated people and was physician to Queen Elizabeth; the story that she left him a legacy shows her liking for him. Gilbert and Dr. Lancelot Browne, in 1584, together signed a medical certificate which is preserved in the Records Office; in 1588 both were selected to advise the Privy Council about the health of the Navy, and Browne held various offices at the College of Physicians, so, in one way and another, he must have known Gilbert intimately. Lancelot Browne's daughter married Harvey in 1604. Gilbert died in 1603. Considering the close acquaintanceship between Gilbert and Browne, Harvey must have heard much of the first and quite likely he met him when he was courting; anyhow, it appears that he knew a good deal about him, for Sylvanus Thompson tells us that "according to Harvey, Gilbert expended no lesser sum than five thousand pounds on his researches." Therefore we may conclude that, for both professional and family reasons, Harvey would be inclined to pay attention to anything Gilbert said.

Gilbert's outstanding position is due to this—he broke away from tradition, he challenged authority, he went to Nature herself, investigating her by experiment, and he employed proper inductive reasoning. The first words in the preface of his famous book on the magnet are:—

> "In the discovery of secret things and in the investigation of hidden causes, stronger reasons are obtained from sure experiments and demonstrated arguments than from probable conjectures and the opinions of philosophical speculators of the common sort; . . . . But if any see fit not to agree with the opinions here expressed and not to accept certain of my paradoxes; still let them note the great multitude of experiments and discoveries; these it is chiefly that cause all philosophy to flourish; and we have dug them up and demonstrated them with much pains and sleepless nights and great money expense." [67]

This book made Gilbert the father of experimental philosophy in this island; it is the earliest known work treating of both magnetism and electricity; few finer examples of inductive reasoning have ever been presented to the world; there is abundant testimony that it produced a deep impression, not only in this country, but throughout the civilised universe: it places Gilbert on a level with Harvey, Galileo, Gassendi, and Descartes.[68] Galileo says:

"I extremely praise, admire, and envy this author for that a conception so stupendous should come into his mind. I think him moreover worthy of extraordinary applause for the many new and true observations he has made." [69 70]

Sir Kenelm Digby writes—

"by means of whom (Gilbert) and of Doctor Harvey our nation may claim even in this latter age as deserved a crown for solid Philosophical learning." [71]

Coming down to modern times C. W. Cooke [72] tells us that "De Magnete" inaugurated a new epoch in physical science, its author announced discovery after discovery, all made by a series of experiments conducted in a most philosophical manner. He was the first electrician, he was the first to investigate electrical phenomena, and the word electric was coined by him. Sylvanus Thompson considers that Gilbert made 20 separate experimental discoveries in electricity alone.

It will not be amiss, before we leave "De Magnete," to glance at the short reference to medicine to be found in it. In Book I., Chapters XIV. and XV., Gilbert [73] ridicules the medical nonsense which has been talked about the loadstone, such as that, in small doses, it preserves youth, that smeared with garlic it ceases to be active, that when pulverised and then buried in plaster it will draw an arrow from the body, that it will cure all sorts of headaches. He sums up by saying: "Thus vainly and preposterously do the sciolists look for remedies when ignorant of the true causes of things." Chapter XV. treats of the medicinal virtue of iron. Gilbert is aware of its use in chlorosis, for "it restores young girls when pallid, sickly, and lacking colour, to health and beauty." Malaria was very common in England in his time; hence we find Gilbert advising iron for enlarged spleen; the patients improved, probably because the iron benefited their anæmia. He notices that it is astringent. These are its only medicinal virtues. This is an excellent account of the therapeutics of iron, we know but little more now. Gilbert is very sarcastic about the many ridiculous claims made for it by doctors. He says:

"Thus do the smatterers cross swords together, and puzzle inquiring minds by their vague conjectures, and wrangle for trifles as for goats' wool, when they philosophize wrongly."

In Book II., Chapter III., he points out that Galen errs in believing that whatever agents draw out the venom of serpents exhibit the same power as the loadstone; he is emphatic that drugs do not act in this way. These extracts show him to have been what was very rare in his day—namely, a scientific physician, believing no more than he sees, and scornfully disbelieving the rubbish that passed for medicine.

The "Advancement of Learning" appeared in 1605, two years after Gilbert's death, so it cannot have been of use to him, and the only one of Bacon's writings which can have been published before 1600, when "De Magnete" appeared, is "Partus Masculus Temporis" (The Male Birth of Time), but the date of this, which is only a fragment, is doubtful. There is no trace of any acquaintance between Gilbert and Bacon, therefore we must admit that there is nothing to show that the last can have affected the elder; consequently the glory of being the first in this country, at any rate, to break through the bonds of authorities and to properly use experiments and induction belongs to Gilbert. Considering his professional position, his sound medicine, his close acquaintance with Harvey's father-in-law, the fact that his arresting book appeared just when Harvey was beginning his medical work, that it was just such as would appeal to the discoverer of the circulation, for it, by example and precept, taught that the right way to investigate nature was by experiment and induction, and that Harvey's recreation was mathematics; bearing in mind all this it is not unreasonable to believe that Gilbert helped to direct Harvey's thoughts.

THE ATMOSPHERE IN WHICH GILBERT, BACON, AND HARVEY LIVED.

Hitherto we have only considered Bacon, Gilbert, and Harvey individually, but in what atmosphere did they live? Sir John Edwin Sandys tells us that—

"the love of discussing on learned and philosophic topics was one of the characteristics of serious society in the Elizabethan age." [74]

Sir Sydney Lee and Dr. Furnivall both say that the era of Elizabeth was that of learned culture and a desire for knowledge among large numbers of the people.[75] Several accounts have been given of the Society of Antiquaries, founded in 1572. It was a great success:

"Peers and commoners, diplomatists and exchequer officials, heralds and city tradesmen, country and town gentlemen, schoolmasters, lawyers and clergymen, all met together, week by week, to discuss archeological and constitutional problems." [76 77 78]

At the same time there was another learned society which met at Gilbert's house on St. Peter's Hill. Sir Humphrey Gilbert, half brother to Sir Walter Ralegh, laid before Queen Elizabeth a scheme for the erection of "An Achademy for educacion of her Maiestes Wardes and others, the youth of nobility and gentlemen." It was to have been a real University of London; there were to be dozens of well-paid teachers, including one in natural philosophy, and there was to be one doctor of phisic. His duties I will give in the old spelling. One day he was to reed phisick and another surgery, in the English tongue. He was never to alleage any medicine of any kind but that he was to declare the reason philosophicil of every particular and he was to show how the medicine was made and all the instruments used in making it. The physitian was to practise surgery because there were very few good surgeons, for surgery was only to be learned in barbers' shops, which was most dangerous. The physitian was continually to practise with the Natural Philsopher to try and search out the riddles of nature, they were to share a garden for the growing of simples and for this they were to have an extra allowance.[79]

Learning was evidently much in men's thoughts and in their conversation. Therefore on this ground, also, we may reasonably conclude that Harvey would have knowledge of the teaching of Gilbert and Bacon.

Many who have written about the glorious Elizabethan renaissance have told us of its literature, its theatres, its politics, its statesmen, its voyagers and its romance, but few have dwelt upon its science. Until the closing years of the great Queen's reign ignorance, superstition, tradition, and false reasoning darkened understanding, but then, as with other branches of human activity, so with science, great lights arose in this country—Gilbert, Bacon, and Harvey—men's minds awoke, the science of electricity was founded, we were taught how to reason and modern physiology was born; English science dates from these three who were contemporaries; fortunately they were not, like Galileo, Bruno, Servetus, and others, persecuted on account of the novelty of their pronouncements. The Elizabethan era is an example of the well-known, singular phenomenon that there are periods in which a cluster of geniuses appears, and this College can justly be proud that two of its Fellows may be grouped with Shakespeare and a few others among the greater Elizabethans. Harvey's supreme eminence among scientists is so well acknowledged that there is no need for me to extol it. Rather have I tried to show that, not only was he a star of the first magnitude himself, but he was also part of one of the brightest constellations the world has seen. No man can certainly say what

makes any man's mind, but, for the reasons brought forward in this address, it does seem likely that, as Harvey was the youngest of these three, the other two had some directing effect, of which Harvey was perhaps unaware, in steering his thoughts correctly towards that goal, the reaching of which has made him one of the great men of all time.

All three were parched with a thirst for knowledge, and it would be difficult to find a better epilogue to this oration than a quotation from the "Praise of Knowledge," a masque written by Bacon and performed before Elizabeth in 1592:

"Therefore no doubt the sovereignty of man lieth hid in knowledge wherein many things are reserved which kings with their treasure cannot buy, nor with their force command; their spies and intelligencers can give no news of them; their seamen and discoverers cannot sail where they grow. Now we govern nature in opinions but are thrall to her in necessities. But if we would be led by her in invention we should command her inaction."

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Ingleby Lectures

ON

PLACE-IN-FAMILY AS A FACTOR IN DISEASE.

Delivered at the University of Birmingham

BY G. F. STILL, M.D. CAMB., LL.D. EDIN., F.R.C.P. LOND.,

PROFESSOR OF DISEASES OF CHILDREN, KING'S COLLEGE HOSPITAL; CONSULTING PHYSICIAN, THE HOSPITAL FOR SICK CHILDREN, GREAT ORMOND-STREET.

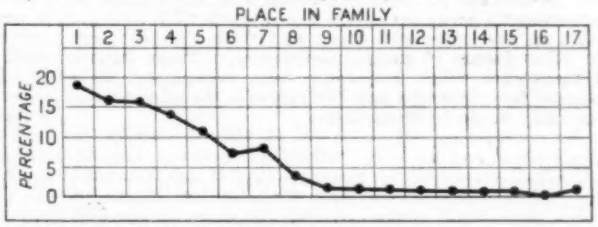
LECTURE II.*

IT will be well at the outset of this lecture, in which I propose to consider further the relationship of place-in-family to certain affections in children, that I should summarise the arguments and evidence with which the previous lecture was concerned.

That place-in-family may have some influence in determining liability to disease is not a new idea. Various writers have suggested it with regard to particular affections, but mostly with meagre and unsatisfactory evidence. There has been a tendency to confuse incidence with liability, the fact, for instance, that there is a much larger number of first-born than second-born in the statistics of any particular disease has been adduced as evidence of some special liability of the first-born regardless of the possibility that this predominance might be due to excess of first-born in the general population. It is only by comparing the place-in-family incidence of the particular affection with the place-in-family distribution of the general population that any conclusion can be formed as to any special liability attaching to place-in-family. Almost all the statistics which have been published on this point have omitted miscarriages and stillbirths from the order of pregnancies, so that what is recorded, say, as first-born may have been a third or fourth pregnancy or even later; a serious fallacy if, as seems at least possible, it is the occurrence or non-occurrence of previous pregnancies, whether they went to full term or not, which determines whatever influence place-in-family may have upon the offspring. The necessity of including miscarriages and stillbirths introduces a great difficulty in obtaining any reliable statistics of the general population to serve as a standard of comparison, for there is no official registration of miscarriages and until recently none of stillbirths.

It was necessary, therefore, to obtain from some private source figures which were not subject to this fallacy, and I showed various charts which had been drawn up for this purpose, and gave reasons for selecting as the nearest approximation to accuracy statistics of certain diseases which might be regarded as "neutral" so far as my influence of place-in-family is concerned, and from these obtained a standard curve (Fig. 6). When, as a working hypothesis, a standard of comparison had been established,

FIG. 6.—*Standard Curve (Repeated from Lecture I.).*



The exact percentages indicated in Fig. 6 are: 18·5, 16·1, 15·4, 13·4, 10·8, 7·5, 7·6, 3·9, 2·1, 1·7, 1·6, 1·1, 0·7, 0·4, 0·1, 0·0, 0·1.

* Lecture I. appeared in the last issue of THE LANCET.

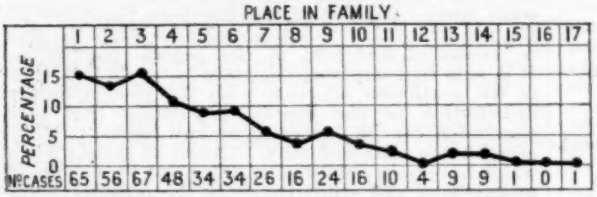
several affections of children were considered in turn, and it was shown by comparing the place-in-family incidence of certain affections with this standard that there is a special liability in the first pregnancy to abnormalities of development in the offspring. This was seen to be most striking in regard to congenital hypertrophy of the pylorus, but other congenital anomalies—viz., congenital heart disease, congenital malformations of various kinds, mental deficiency (exclusive of Mongolism), and probably epilepsy—were all found to show a similar relationship to the first pregnancy. A doubt arose with regard to the congenital spastic cerebral palsies because it is certain that some of these are due to intranatal causes rather than to antenatal, and my inquiry deals only with the influence of place-in-family in regard to conditions of antenatal origin.

MONGOLISM.

I pass on now to consider a particular form of mental deficiency with reference to place-in-family —namely, Mongolism. The chart in Fig. 14 comprises 420 cases (250 collected by Dr. J. Thomson, 170 by myself). It is seen to be in remarkable contrast with the curve shown by other forms of mental deficiency. Its special features are the comparatively low proportion of first-born and relatively high proportion of late-born children. The percentage of first-born is even lower than that shown by the "neutral" diseases which were taken as the standard of comparison, the percentage of cases occurring with the eighth to seventeenth pregnancies (20·4) contrasts with 11·7 per cent. in the standard chart and with 0·2 per cent. in other forms of mental deficiency. These figures demonstrate what has long been recognised as a clinical fact, that the late-born child is for some reason specially liable to Mongolism.

In considering the relation of place-in-family to Mongolism and to other affections account should, I think, be taken of the association of Mongolism with congenital heart disease and with malformations of other parts of the body. Of my 170 cases, 12 showed congenital heart disease—i.e., 7 per cent.—and other observers have found a much higher proportion, such as 15·7 per cent. (Thomson). A great variety of other congenital abnormalities have been found in association with Mongolism. I have not kept figures of the frequency of their occurrence, but in one series of observations (Thomson) it was 22 per cent. These associations make it probable that whatever may be the relationship between place-in-family and Mongolism the same holds good for the congenital heart disease or other abnormalities associated with Mongolism in these cases, and if the cause which underlies Mongolism can interfere with development so as to produce also these particular abnormalities, cardiac and otherwise, it seems likely that the same cause may also play some part in the production of developmental abnormalities apart from Mongolism.

FIG. 14.—*Mongols (420 Cases).*



This brings me to the significance of place-in-family, and first of all with regard to Mongolism. It is obvious that there are two factors which may be concerned in the special liability of the late-born to Mongolism—the number of pregnancies and the age of the mothers. Multiparity is certainly not essential to the production of Mongolism; amongst the 420 cases in Fig. 14 there were 65 cases belonging to the first pregnancy. But the large proportion of late pregnancies in comparison with that shown in the curves of other affections does at least justify the question whether the number of pregnancies has a greater influence than the age of the mother in determining the incidence of Mongolism on the late-born.

It is difficult to answer this by statistics, for obviously multiparity carries with it the probability of a more advanced age than is usual in the primipara. If it were found that when Mongolism occurred amongst the earlier pregnancies, such as the first or second, the age of the mother was usually higher than that of the average primipara or secundipara, this would point to the influence of age. I have notes of the age of the mother at the birth of a Mongol first-born in 26 cases; 19 of these were over the age of 30, including 11 of 35 years or older; the average was 33·3 years. As 56·5 per cent. of marriages (according to the Registrar-General's statistics for 1923) take place under the age of 25 years, and only 10·1 per cent. in women over 30 years of age, it is probable that the average age of the primiparous mother is considerably under 30 years; indeed, if the observations quoted by Matthews Duncan still hold good that the average interval between marriage and the birth of the first-born is about 12 months, the majority of primiparæ should be not more than 26 years old. The average age, therefore, of the mothers whose first pregnancy results in a Mongol is at least seven years above that of the majority of primiparæ. It is also about seven years above the age of the primiparous mother whose pregnancy results in a child with some other form of mental deficiency. In 77 such cases the average age was 26·2 years. So far, therefore, as statistical evidence goes, it would seem from the comparative infrequency of Mongolism in first pregnancies, and from the fact that when Mongolism does occur in the child of a first pregnancy the mother is usually considerably beyond the average age of primiparæ, that the age of the mother is a more important factor in the production of Mongolism in the first-born than is the primiparity.

Again, if the special incidence of Mongolism upon the later children were due to the number of pregnancies which have preceded, rather than to the age of the mother, it might be expected that in the exceptional cases where a young woman less than 30 years of age produces a Mongol it would usually be found that she was a woman who had married early and had had at least three or four pregnancies before the Mongol. I have said "three or four pregnancies," but this is merely hazarding a guess at the number, if any, which might be thought to favour the occurrence of Mongolism. Actual figures taken without regard to the age of the mother (as in Fig. 14) prove that in 63·9 per cent. of the families in which Mongolism occurs there have been not less than three children before the Mongol, and in 52·5 per cent. not less than four children preceding the Mongol. This may be contrasted with some of the "neutral" diseases described in the previous lecture; for instance, in diarrhœa and digestive disorders, of 1000 cases 45·7 per cent. occurred in a child preceded by not less than three pregnancies and 32·8 in children preceded by not less than four pregnancies, and the corresponding figures in 400 cases of broncho-pneumonia were 49·7 per cent. and 37·45 per cent. A comparison of these figures justifies the expectation that if the number of antecedent pregnancies is an important factor in the causation of Mongolism, we should find that at least a considerable proportion of the mothers who gave birth to Mongols before they are more than 30 years old would have had three or four pregnancies before it.

I can only produce very small figures on this point because women under 30 years of age comparatively rarely produce Mongols. I have notes of 17 cases in which the mother of a Mongol was not more than

30 years old when the child was born; only three of these had had three children or more previously, eight of them were primiparæ, and five had had one previous pregnancy. So far, therefore, as this small number of cases is any criterion, it does not show that the number of antecedent pregnancies is particularly high in cases where the mother of a Mongol is exceptionally young, and it gives therefore no support to the view that the occurrence of Mongolism is due to the number of previous pregnancies. From these various considerations the conclusion seems to be justified that the influence of place-in-family in regard to Mongolism is only indirect; it is the age of the mother rather than the number of the particular pregnancy which determines the occurrence of Mongolism. This conclusion, it must be pointed out, throws no light upon the clinical fact that when a Mongol has occurred, whether early or late in the family, any subsequent children almost never show Mongolism.

FIG. 15.—*Age at Marriage in General Population.*

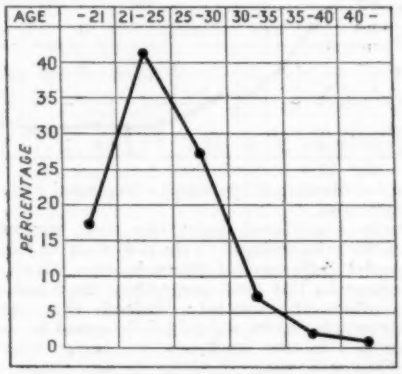
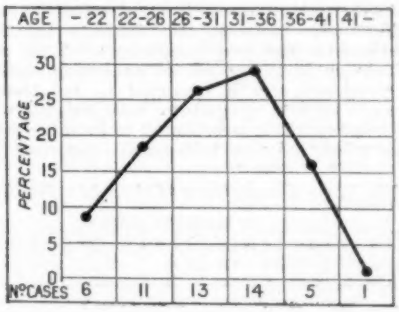


FIG. 16.—*Maternal Age at Birth of Congenitally Deformed Child.*



INFLUENCE OF THE MOTHER'S AGE.

In considering the occurrence of Mongolism in the first-born, I have shown that in that condition primogeniture was comparatively infrequent and that when it occurred it was probably of less importance in causation than the age of the primipara. How far is this true of other conditions? If the conclusions already reached are correct as to the special liability of the first-born to various congenital anomalies, is this because of the age of the mother or is it because primigravidity has some special influence per se, independent of the age of the mother? Primigravidity as a general rule implies comparative youthfulness of the mother, and the special incidence of any affection upon the first-born might, therefore, very naturally suggest that the chief, if not the only, factor in causation was the youthful age of the mother or as some writers have expressed it, her immaturity. If this is so the proportion of mothers of comparatively youthful age should be higher amongst those whose first pregnancy results in a child with some congenital malformation or abnormality than amongst the primiparæ of the general population.

In the Registrar-General's report for 1923 the age at marriage in the general population of England and Wales was: Up to 21 years, 15·3 per cent.; 21 to 25 years, 41·2 per cent.; 25 to 30 years, 27·9 per cent. (Fig. 15.) So that more than half the marriages occur under 25 years of age, and assuming Matthews Duncan's estimate to be correct that on the average the interval between marriage and the birth of the first-born is one year, one might suppose that at least 50 per cent. of primiparous labours would occur under the age of 26 years. There is some correction to be made for sterility, but to quote Matthews Duncan again, "those married at ages from 20–24 inclusive are almost all fertile," whilst of women married under 20 years of age about 7 per cent. are sterile. The correction to be made, therefore, is very small. In 50 cases of congenital deformities, including congenital heart disease, all occurring in first pregnancies, I have noted the age of the mother at the birth of the child and have reduced the numbers at the various ages to percentages which are shown in the chart (Fig. 16) so as to facilitate comparison with the average age at marriage.

It will be seen that so far from the proportion in the younger age-groups being higher than in the general population, it is decidedly lower, and the proportion in the later age-groups is actually higher than in the general population. So far, therefore, as these small figures are reliable there is no evidence that the special liability of the first-born to congenital abnormalities such as congenital heart disease, hare-lip, cleft palate, hydrocephalus, congenital hypertrophy of the pylorus, congenital deformities of limbs, &c., is due to the mother being below the average age of a primipara; or to put it in another way, there is no evidence that immaturity of the mother plays any part in the production of these abnormalities. Indeed, these figures rather suggest that an age above the average age for primigravidity is more favourable to these perversions of development than any unusual youthfulness of the mother. Moreover, in view of the frequent association of various congenital anomalies with Mongolism it seems probable that advanced age of the mother may be a factor also in the causation of congenital anomalies when they are not associated with Mongolism. If this is the case, and if, therefore, there are two factors in the production of congenital anomalies pulling, so to speak, in opposite directions, the one towards the first place-in-family because of the special influence of primogeniture, the other towards the late place-in-family because the mother is then reaching advanced age, the fact that in spite of these opposing tendencies there is such a remarkable predominance of first-born with congenital anomalies emphasises even further the influence of primogeniture.

INFLUENCE OF PRIMIGRAVIDITY.

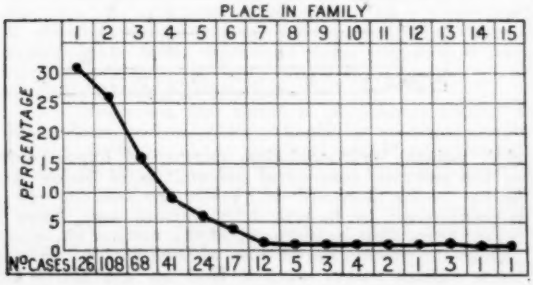
Is there any evidence then that independently of the age of the mother the first pregnancy is at a disadvantage? So far as the nutrition of the fœtus is concerned there is undoubtedly a tendency for the first pregnancy to fare badly. It is a common observation that the weight and length of the first-born are commonly less than those of subsequent children; various observers have published figures demonstrating this, notably Dr. Matthews Duncan (loc. cit.) who also discussed its relationship to primogeniture. He held that this relative deficiency in weight and length was directly dependent upon the age of the mother, whereas Hecker had regarded it as due to primogeniture per se. Subsequently, Hecker partly adopted Dr. Matthews Duncan's view, but with the reservation that age was not the only

factor—some influence must be exerted by primogeniture. It was recognised by these observers also that although on the whole there is much uniformity in the weights of the children of the subsequent pregnancies, there is in the later pregnancies a tendency to a decrease in the weight of the child, a fact which may not be without its significance in regard to the occurrence of anomalies of development in these later pregnancies. Comparative physiology gives some confirmatory evidence on these points; chicks from pullet's eggs are, on the whole, smaller than chicks from hen's eggs; a first litter of pigs is commonly smaller in number and smaller in size than later litters; with rabbits also a first litter is apt to consist of smaller rabbits than a later one. Again, one may compare with the production of Mongols in late pregnancies the production by hens of eggs containing no yolk when they make their last efforts at laying.

MISCARRIAGE IN THE FIRST PREGNANCY.

There is another fact which may have a still more important bearing upon the antenatal liabilities of the first-born—namely, the relative frequency of miscarriage in the first pregnancy. This attracted my attention in the course of analysing statistics for other purposes, and it occurred to me that a predominance of first pregnancy miscarriages would be more significant if it were found to be more marked in families where only one miscarriage occurred than if it

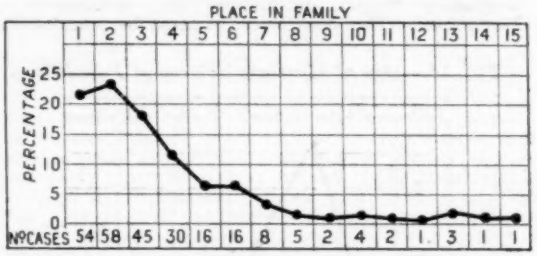
FIG. 17.—*Miscarriages (416 in 328 Families).*



were chiefly in families where several miscarriages occurred, for any selective character of the incidence of miscarriage might be obscured in the latter group. The only statistics which I am able to produce are open to the criticism that the families from which they were taken were not in all cases completed families. My impression is, however, that though statistics entirely free from this fallacy might alter the percentages to some extent, they would still show the same peculiarity in the incidence of miscarriage. It is seen that in 170 families when there was only one miscarriage this occurred in the first pregnancy in 42·3 per cent. of the cases, whereas in families in which there was more than one miscarriage the first pregnancy was affected in 22·1 per cent. of the cases. If there is no particular pregnancy which is more liable than any other to miscarriage, there seems to be no reason why the place-in-family incidence of miscarriage should not be identical with the place-in-family distribution of the general population, but if there is some special tendency to miscarriage in the first pregnancy, then the inclusion of the families in which only a first pregnancy miscarriage occurs will exaggerate the incidence on the first-born just as would the inclusion, say, of cases of congenital hypertrophy of the pylorus in a series of neutral diseases, especially if the pylorus cases were in the undue proportion which occurs, for instance, in the case notes of a children's physician.

A comparison of the three charts given here seems to bear out the view that for some reason there is a special liability of the first pregnancy to miscarriage; the chart (Fig. 17), including all miscarriages, shows 30·4 per cent. in the first pregnan cy,a figure considerably above the proportion of first pregnancies in the general population, in those statistics which, as I showed in my first lecture, could fairly be taken as a standard. If the families are excluded in which there is only one miscarriage the proportion of miscarriages is then 22·1 per cent. (Fig. 18) in the first pregnancy, which approximates to the proportion of first pregnancies in the standard curve of the general population, 18·5 per cent., whilst the chart of the families in which there is only one miscarriage (Fig. 19) shows an incidence on the first pregnancy of 42·3 per cent., a proportion higher than that shown by any

FIG. 18.—*More than One Miscarriage (246 in 85 Families).*

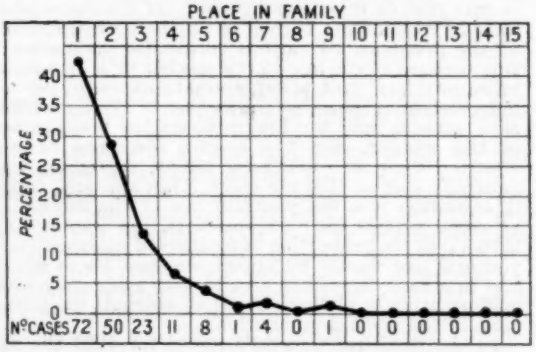


congenital abnormality except congenital hypertrophy of the pylorus.

I have considered only the first pregnancy in relation to miscarriage. I do not wish to imply that the special influence, if there is one, which favours miscarriage in the first pregnancy may not in some degree affect the second; indeed, the analogy of syphilis which shows a gradual decrease in successive pregnancies in its tendency to cause miscarriage, would suggest that if there is any toxic element specially favouring the occurrence of miscarriage in the first-born this might extend in some degree beyond the first pregnancy. Here, however, I am concerned with the first chiefly, and the figures already given furnish at least ground for supposing that there is in the first pregnancy some influence at work in the mother which makes this particular pregnancy specially liable to miscarriage.

It is more than possible that such an influence might in some cases result not in miscarriage but in

FIG. 19.—*Single Miscarriages (170).*



the death of the fœtus so that it would be stillborn. This possibility would be analogous to the effect of parental syphilis, which, as is well known, often produces at first one or more miscarriages and then a stillbirth premature or at full time before a living child is born. Stillbirths, therefore, may be another manifestation of the special influence, whatever it may be, which favours the occurrence of miscarriage in the first pregnancy. It is not suggested that stillbirth in the first pregnancy is usually the result of any such cause, it is certainly not! The mechanical difficulties of a first labour are undoubtedly the most frequent cause of the stillbirth; nevertheless, there

are cases in which there is no such mechanical cause, and, indeed, death of the fœtus has occurred before labour began. I have no figures to show whether this death of the fœtus before labour is relatively commoner in the first pregnancy than in later pregnancies, but stillbirths are certainly much commoner in the first than in the later pregnancies. In the 328 families already mentioned there were 74 stillbirths, and of these 36—i.e., close on 50 per cent.—were in the first pregnancy. I do not suggest that miscarriage is always a morbid process, but it certainly is in some; I have already instanced the effect of syphilis. On the other hand, it does not seem likely that miscarriage, when occurring apart from obvious disease, is a merely fortuitous occurrence. No doubt there are many miscarriages which are due to purely accidental causes, physical or psychical, but there remains a considerable proportion which cannot be explained in this way.

RELATION OF MISCARRIAGE AND STILLBIRTH TO PERVERSION OF DEVELOPMENT.

In the special liability of the first pregnancy to miscarriage there may be some indication of perversion of process which in particular cases leads to ejection of the embryo or fœtus, and in others, where pregnancy continues, to the production of a child with some congenital abnormality. If this were so one would expect that the ejected embryo or fœtus would itself sometimes show abnormality of development. This has been found to be the case. Mall[1] found that 38 per cent. of aborted fœtuses were pathological and some showed definite abnormalities of development, and there seems to be general agreement amongst obstetricians that abnormality in the embryo or fœtus is one cause of miscarriage; if this is so, and if miscarriage tends to occur specially in the first pregnancy, we may have here further confirmation of the special tendency to abnormalities of development in the first pregnancy.

I know of no observations on the frequency of abnormal embryos or fœtuses in relation to place-in-family of the pregnancy. Routine investigation of the products of miscarriage and stillbirth from this point of view might give valuable information. It is a pity that these are often treated as negligible items in the reproductive history of a woman; it is possible that they might furnish some useful clue to the problem of developmental abnormality. If, as the figures already shown suggest, there is a special liability to miscarriage in the first pregnancy, how far is this predominance due to special frequency of abnormalities in the embryo or fœtus, and how far are both the result of some perversion of reproductive metabolism to which primigravidæ are specially liable? Unfortunately, upon this point, which may be nearer to the root of the whole problem of congenital abnormalities than we know, I can throw no light.

It is true that the impregnated ovum meets with conditions in the uterus of the primigravida which are peculiar to the first pregnancy; it finds a uterus in which there is as yet no enlargement or thickening of the arteries for the increased requirements of blood-supply, no modification of the venous channels by the involution processes of former pregnancies; all these have yet to be acquired; the environment is special, and at first sight one might imagine that the peculiarity of the first pregnancy in these respects might influence not only the continuation of the pregnancy but also the development of the embryo and fœtus. But even if it be granted that differences in the conditions of blood-supply may affect the nutrition of the embryo and fœtus, this is not necessarily any explanation of perversion of development. There is reason for thinking that the causes of developmental abnormalities lie deeper than mere difference of blood-supply.

The selective character of congenital abnormalities in some cases and their hereditary character in others seem to argue some altogether subtler and more profound influence. By "selective" I mean the tendency to fix upon particular structures in particular families; for instance, I have notes of one family in which there were only two pregnancies and both had congenital hydrocephalus; in another family there were two children with syndactyly, in another two with congenital heart disease, and in another I saw a boy who was said to be one of three who had congenital heart disease out of a family of 13; more striking examples are on record of six and seven children with congenital hydrocephalus, and in one instance six successive premature infants, and then three full time, all nine having congenital hydrocephalus (Göhlis). In most of the examples I have quoted—and, as I mentioned in my previous lecture, the occurrences of congenital deformities in more than one member of a family is uncommon—the malformation occurred in the first pregnancy and was repeated in subsequent pregnancies, so that whatever the influence may be which determines the special liability of the first pregnancy, to such abnormalities, it is not necessarily confined to the first; it is sometimes so profound that it extends to one or more of the later pregnancies, though fortunately it very rarely does so.

TOXÆMIA IN THE PRIMIGRAVIDA.

If the metabolic changes accompanying pregnancy are liable to perversion it is quite conceivable that some chemical change in the mother's blood or tissues might affect the development of the ovum and embryo, and the experimental observations upon animals by Hertwig, Loeb, Stockard, and others quoted by Dr. Mall (loc. cit.) suggest that such a cause might even produce particular malformations according to the character of the chemical change. On such an hypothesis the repetition of the particular congenital anomaly in several children of the same mother would be intelligible. This view might also throw some light on the special liabilities of the first pregnancy, for it is known that there is a special tendency to the grosser toxæmic states in the primigravida. Recent figures taken on a large scale by independent observers[2] have shown that 74 per cent. of the cases of toxæmia in pregnancy occur in primigravidæ. This incidence, like the special tendency to abnormalities of development in the first pregnancy which I have shown not to be dependent upon any special youthfulness of the mother, is not dependent upon her age; "primigravidæ," says Dr. G. FitzGibbon,[2] are more liable to toxæmia than multiparæ, but the age of the primigravida has no influence on its development." This high percentage, 74 per cent., compared with the standard proportion of first pregnancies, proves, I think, that so far as the grosser forms of toxæmia which produce unequivocal symptoms in the pregnant woman are concerned, there is a marked special liability of the primigravida. If this is so it seems at least possible that the primigravida may also be specially liable to toxic states of less pronounced degree which, without producing obvious effects in the woman, may adversely affect the ovum or embryo. I would suggest that in some such special tendency of primigravidæ to a toxic state we may have an explanation in part at least of the special liability to congenital abnormalities in the offspring of the first pregnancy.

I have said "in part," for it is evident that even so far as the first pregnancy is concerned, place-in-family is not the only cause of congenital anomalies; advanced age of the mother is sometimes a factor, as shown in cases where Mongolism occurs in a first-born and probably in some cases where other congenital anomalies occur in the first-born of an elderly mother, for as I have shown the association of such anomalies with Mongolism in a late-born child seems to indicate that the age of the mother can be responsible for them also.

But surely there are other factors concerned in the problem of place-in-family even less capable of demon-

[1] F. P. Mall in Keibel's Manual of Human Embryology, p. 207.

[2] Jour. of Obstetrics and Gynæcology of Brit. Empire, 1923, xxix., 390. [2] Ibid., p. 404.

stration than those I have considered. Is it likely that the reproductive process is exempt from those irregularities which characterise other functions of the body at their inception and at their decline? Imperfect function at first, failing function at last, this is so well ascertained an order of physiological events in respect of other processes that it may well apply also to the reproductive process and so be to some extent at once an explanation and a confirmation of the relation between place-in-family and developmental anomalies. Certainly Nature's first experiment at reproduction is more often a failure than her later ones; and when the reproductive period is nearing its close, Nature is again prone to failure, and if miscarriage and developmental anomalies are so closely connected as I have suggested, it may be that the special liability to miscarriage in the first pregnancy is more often a boon than we know: Nature thereby may be throwing aside the imperfect result of her first effort.

INTERVAL BETWEEN PREGNANCIES.

I pass now to another point which I think merits more attention than it has received. I know of no published reference to it, though I know from conversation with colleagues that it has not been unnoticed. I refer to the occurrence of some congenital abnormality in the child born at an unusually long interval after the preceding pregnancy. What may be the interval which encourages this risk I am not prepared to say. I have noted particularly cases with six years or longer interval; possibly the risk, if it exists, may be proportionate to the length of the interval; certainly in many of them it is eight or ten years or even longer. The occurrence of a long interval before the abnormal child is particularly noticeable in Mongolism. I have notes of several cases with 10, 11, and 12 years interval between the previous pregnancy and the Mongol, and of others with five, six, or seven years interval. This is by no means limited to Mongolism. I have noted it, though less frequently, in other forms of mental deficiency, and in various congenital abnormalities and deformities. Many of my records were taken before this point had attracted my attention so I am unable to offer any opinion as to its frequency, and it is essential that the frequency of its association with abnormality of the offspring should be compared with the frequency of similar intervals where the offspring are not abnormal, before any conclusion can be drawn as to a causal relation.

In the absence of sufficient statistics to have any evidential value, I can only draw attention to the possibility that pregnancy separated by an unusually long interval from the preceding pregnancy involves some special risk of abnormality in the offspring. If this is so its explanation must be intimately related to the whole problem of the causation of congenital abnormalities. It might be argued that the age of the mother is advanced to the extent of the interval and that it was because of advanced age and not because of any other influence of the interval that the abnormal offspring resulted. I have notes of cases in which the long interval occurred quite early in the reproductive history of the mother, so that in these at any rate the abnormality of the child could hardly be due to the age of the mother. Possibly the interpretation of this occurrence may be that the longer the interval the closer the return to the conditions of primigravidity, so far as those special influences are concerned which render the primigravida specially liable to have abnormal offspring.

In conclusion, let me say that in these lectures I have tried to accumulate facts which might help towards an understanding of one, at any rate, of the antenatal factors entering into the production of congenital abnormalities—namely, the influence of place-in-family; but I realise that this is only one factor, perhaps only a predisposing factor; the fundamental causes lie deeper. At present we can only feel our way towards them groping in the half-light towards the truth.

A CLINICAL STUDY OF THE
ALKALI TREATMENT OF SCARLET FEVER.

BY E. H. J. BERRY, M.B., M.R.C.P. LOND.

DURING the treatment of nephritis of all types, A. Osman [1] noticed that when an acid urine was made alkaline the amount of albumin passed was lessened and the amount of urine passed was increased, with a corresponding improvement in the patient's general condition. While working along these lines, he encountered a case of anuria caused apparently by a large does of sanocrysin. The anuria was overcome after large doses of alkalis, and the patient recovered. To determine whether this principle of rendering the urine alkaline was effective in nephrites other than those caused by metallic poisons, he determined to try the treatment in scarlet fever, of which abundant material would be available. A short résumé of his results was given in an address to the Royal Society of Medicine, in which he stated that the incidence of cases of albuminuria and nephritis had fallen from 5·5 per cent. to 0·6 per cent.[1] These figures are so remarkable that they demand further investigation; there can be no doubt that a new and valuable principle in treatment has been discovered.

In the past, alkalis have been given empirically as diaphoretics for febrile disturbances such as occur in the exanthemata. They were thought to be "cooling" medicines, and there was no clear conception as to how they acted and why they undoubtedly did good. Now that the urine is being tested for acidity and alkalinity, it seems that in most cases these drugs were not being given in sufficient quantities, and that because their manner of action and effects on the urine were unknown, their administration was not properly controlled.

Before the introduction of salicylates, rheumatic fever was treated by large doses of alkalis, and even now, as Osler states, improvement in the condition of the patient takes place as soon as the urine becomes alkaline.

That alkalis tend to prevent the onset of nephritis in scarlet fever has been proved beyond doubt, but that the alkali treatment is also of value in the prevention of other complications and as a curative measure has apparently escaped notice. If alkalis prevent the onset of one toxic manifestation, and if the various complications of scarlet fever are due to one particular scarlatinal toxin acting on tissues of varying resistance, it is reasonable to suppose that they would prevent the onset of other manifestations, possibly toxic in origin, such as, for example, scarlatinal rheumatism.

From the following figures I wish to show that albuminuria and rheumatism are closely related, and that, in preventing the onset of one, we can prevent the onset of the other.

Reliable figures of the crippling effects of rheumatic fever on the heart were given by Cheadle in 1889. He stated that 72 per cent. of children suffering from rheumatic fever showed cardiac lesions. Sir Thomas Horder, in 1926, quoted the conclusions which Church made over 40 years ago. These are practically the same as those quoted by Cheadle, but Church adds that cardiac and lung complications were at that time diminishing. Cardiac complications do not occur so frequently in scarlatinal rheumatism, but they are present to the extent of 17·3 per cent. If it can be proved that the alkali treatment can prevent or lessen the incidence of scarlatinal rheumatism, then the beneficial effect of the alkali treatment is indeed very great.

The treatment of scarlet fever, until the recent introduction of anti-scarlatinal serum, was entirely symptomatic and empirical. I have not been able

[1] Proc. Roy. Soc. Med., 1927, xx., 1405; see THE LANCET, 1927, i., 971 and 1107.

to try American anti-scarlatinal serum, but have used British serum. The results, in my hands, have not corresponded with those of Gardner Robb,[1] and, on the whole, have been unsatisfactory. The alkali treatment has given much better results.

For this article a study has been made of all the cases of scarlet fever which were admitted to Joyce Green Hospital in 1926. There is a convention in this hospital of calling those cases where albumin alone appeared in the urine, cases of albuminuria, and those cases in which the urine contained blood and albumin, cases of nephritis. To my mind the difference is only one of degree. Nephritis may first manifest itself by the appearance of blood and albumin in the urine; in other cases the urine will first contain albumin and later blood. Others, again, may have intermittent albuminuria and blood in the urine later. These manifestations may occur at any time of the disease, from admission to the sixth week, but the majority of cases occur in the third week. Therefore, to divide cases into albuminuria and nephritis seems to serve no useful clinical purpose. All cases of albuminuria are actually or potentially cases of nephritis. No laboratory method of estimating the urinary pH was employed; the alkalinity or acidity of the urine was determined by litmus paper. The urine tested was that first passed in the morning, before breakfast.

In 1926, 2819 cases of scarlet fever were admitted to Joyce Green Hospital. No attempt has been made to separate cases of febrile albuminuria from cases of toxic albuminuria. Excluding those which developed another infectious disease before the appearance of albuminuria, there were 303 cases of albuminuria and nephritis—i.e., 10·6 per cent. Sixty-nine cases developed rheumatism—i.e., 2·5 per cent. Of these, 19 had albuminuria. Thus the percentage of rheumatic cases having albuminuria was 27·5. These figures show the close relationship between albuminuria and rheumatism.

The total number of cases showing cardiac complications was 46—i.e., 1·5 per cent. The number of albuminuric cases showing cardiac complications, and in whom no rheumatism was present, was 4—i.e., 1·3 per cent. Thus, albuminuria does not appear to increase cardiac complications. The total number of rheumatic cases showing cardiac complications was 12—i.e., 17·3 per cent. Thus there is a direct relationship between rheumatism and endocarditis.

A review of the first 100 cases treated by alkalis gives some very interesting information. The patients treated were not selected cases. Their ages varied from $1^{11}/_{12}$ years to 25 years. The object was to make the urine alkaline as quickly as possible and to keep it alkaline for three weeks, during which time the patient was kept in bed. Of these 100 cases, one developed albuminuria and rheumatism, and one developed albuminuria while on alkalis. The mixture given contained gr. 40 of pot. cit. and gr. 40 pot. bicarb. to the ounce of water.

CASE 1.—A young soldier, aged 15, admitted April 8th, 1927, with a severe attack of scarlet fever. His urine was made alkaline on the second day, and remained so for three days on half ounce of the mixture. On the sixth morning it contained a faint trace of albumin; reaction still alkaline. The dose of alkalis was doubled, but next morning the urine was acid and he complained of joint pains. The mixture was increased to 1½ ounces. Next morning the urine was alkaline and remained so on the same dose till the patient was discharged. Albumin was present in the urine for six days; there were no casts. The urinary diastase was normal and the blood urea was also normal. He had, on admission, a faint systolic apical bruit, but with the appearance of rheumatism it became more pronounced. There were signs of early phthisis at the right apex. He has since been invalided out of the army.

CASE 2.—A child, aged 5, was admitted on Dec. 31st, 1926. She was given 2 drachms of the mixture, but the urine remained acid on this dose, and on Jan. 3rd the urine contained a trace of albumin. Six drachms of the mixture were given. The urine became alkaline and albumin-free on Jan. 7th. She later developed left otorrhœa but no other complication.

[1] Brit. Med. Jour., 1926, i., 11.

Three cases who were given the mixture for three weeks developed albuminuria after the alkalis had been stopped. One developed rheumatism 20 days after the mixture had been stopped, and albuminuria next day. Alkalis were again given and the urine became albumin-free in four days. Another had, for three days, a faint trace of albumin six days after the mixture had been stopped. The last case developed albuminuria the day his urine became acid. He was transferred from my care and was not given alkalis, but he was discharged well.

It seems obvious that alkalis should be given all the time the patient is considered infectious, especially as nephritis may develop late in the disease. Had the urine of all patients been kept alkaline during their stay in hospital, it is possible that albuminuria would not have developed in three cases. Five per cent. of these cases developed albuminuria, two while on alkalis and three after the alkali course of three weeks had ended. Two per cent. had rheumatism, one while on alkalis, the other after the alkali course was finished.

In Case 1 it is worth noting that when albumin appeared the dose of alkalis was doubled, but in spite of this the urine next day was acid—i.e., the condition of acidosis had increased considerably with the onset of albuminuria.

I have seen the same thing occur in several cases of scarlatinal nephritis. When nephritis developed the urine was made alkaline on a certain dose of alkali; suddenly the urine would become acid and the patient develop joint pains. The dose of alkalis had to be increased considerably before the urine again became alkaline. There would seem to have been a sudden rise in the toxins of the blood, sufficient to cause an acidosis, and a degeneration of some part of the renal tissue.

The curative value of alkalis is most marked in toxic cases. It is not uncommon to see a child with a badly-developed rash, semi-comatose, semi-delirious, with a dry, peeled, cracked tongue. The urine of these patients always contains acid radicles when tested by the ferric chloride test, even when the child has had plenty of carbohydrate. If such a case be treated energetically with alkalis the change in 24–36 hours is very marked. The urine no longer gives a ferric chloride reaction; the tongue becomes moist; the rash becomes vivid; delirium disappears, and the child sits up in bed and takes an interest in the happenings of the ward. The temperature falls by crisis. If the child cannot swallow, the alkalis must be given by the rectum. The quantity of alkalis required to make the urine of a toxic case alkaline is surprising. One child, aged 5, required gr. 640 in 24 hours. I have not seen such a marked change as that portrayed above follow the use of serum.

So convinced am I of the beneficial effects of alkalis in toxic cases of scarlet fever, that I consider all toxæmic cases, from whatever cause, should be treated in a similar manner.

Conclusions.

(1) It has been proved that alkalis very considerably lower the incidence of nephritis. (2) Scarlatinal rheumatism and albuminuria are related to the extent of 27·5 per cent. (3) Scarlatinal rheumatism and endocarditis are related to the extent of 17·3 per cent. (4) Since albuminuria and rheumatism are so strongly related, and the incidence of nephritis can be lowered by alkalis, then it is reasonable to suppose that the incidence of scarlatinal rheumatism can also be appreciably lowered by the alkali treatment. (5) If the incidence of scarlatinal rheumatism can be appreciably diminished, it follows that the incidence of cardiac complications can be lessened. (6) In the acute stages of scarlet fever, if alkalis be given in sufficient doses to render the urine alkaline, great improvement in the patient's general condition results.

I am indebted to Dr. A. F. Cameron, medical superintendent of Joyce Green Hospital, for his kind permission to carry out this work in his hospital, and to the sisters for their willing coöperation.

THE TREATMENT OF THE PARKINSONIAN SYNDROME, FOLLOWING ENCEPHALITIS, BY MALARIA.

BY ROY N. CRAIG, M.D. DURH., D.P.M. LOND., B.S.,
PHYSICIAN-IN-CHARGE OF NERVOUS DISEASES, TORBAY HOSPITAL, TORQUAY, AND THE DISPENSARY, EXETER.

TREATMENT of the after-effects of encephalitis has, so far, proved unsatisfactory. Owing to the considerable degree of improvement which may follow malarial infection in general paralysis of the insane, it was felt justifiable to ascertain the results in encephalitis. Belladonna, hyoscine, parathyroid, and iodides undoubtedly tend to make the patient infinitely more comfortable—more particularly, perhaps, in reducing the constant flow of saliva which is such an unpleasant and constant feature of the Parkinsonian state. They are, however, purely palliative and do not in any way arrest the progress of the disease.

It is possible that the after-effects of encephalitis, such as the Parkinsonian state, are due to damage of the basal nuclei and great correlating centres in the mid-brain during the acute phase of the disease. If this is so, no improvement could be hoped for by treatment, as the damage has already been done. On the other hand, there is a feeling that the Parkinsonian state may be due to a gradual invasion or extension of the disease into the mid-brain, and that the disease is still active. The involvement, in some cases, of the anterior horn cells and perivascular cuffing with lymphocytes rather suggest that the disease is still active. Though the Parkinsonian syndrome may predominate, certain of these cases have such a complex syndrome that it is almost impossible for the lesions to be entirely confined to the mid-brain alone.

It was on the supposition that the disease might be still active that this treatment was undertaken, in the hope that further extension might be arrested and that, if the axon itself had not actually been destroyed, some improvement might take place.

Eight cases have been treated by this method. They were selected from the neurological out-patients in Exeter, the Torbay Hospital, and from private practice. All of these cases had an attack of encephalitis within the last three years, except one case which had the acute attack eight years previously. All had the Parkinsonian syndrome, to a greater or lesser degree, with bradykinesia, tremors of the hands, rigidity of the trunk, excessive salivation, and slow cerebration. There was a varying degree of mental involvement, which is outlined in each individual case. All had diplopia at the time of the acute onset.

Technique.

The technique used was as follows. All the cases were inoculated directly by anopheles mosquitoes infected with a known strain of benign tertian malaria. The mosquito was allowed to inoculate the patient on the thigh through small meshed gauze over a glass beaker in which it was contained. The period of infection varied very considerably—from the twelfth to the twenty-second day after infection. Once this had taken place the temperature mounted with each successive rigor from 99° F. on the first, 100° on the second, 101° on the third, to 105° on the fourth day. The blood was controlled at varying intervals to check the progress of the malaria in order that any very considerable excess of parasites might be foreseen. The temperature was taken every quarter of an hour, during a rigor, until the highest point had been reached and the temperature began to fall. This, though tedious, is an extremely important part of the technique, in that the temperature may mount so rapidly that, if taken at longer intervals, the maximum rise can well be missed by several degrees. Tepid sponging was used whenever the temperature reached 105°. Nine rigors of 105° were aimed at and the infection was not stopped until this had been reached, unless an excess of parasites in the blood film indicated an impending crisis or the patient's condition did not justify further treatment. At the end of the ninth rigor 5 g. of quinine were given three times a day for five days, and 10 g. for the next 12 days. This effectually checked the malaria, and no recurrence has followed.

All the cases treated stood their rigors well, and, though a considerable degree of prostration was present on the day of the rigor, there was a rapid recovery on the following day, which enabled the patient to take ample supplies of nourishment and to fortify himself for the next rise of temperature.

Case Histories.

CASE 1.—H. P., aged 34.

History.—Encephalitis in 1919. Three years later he noticed that he was losing power in both hands and legs and that he was developing tremors in his hands.

Condition Prior to Treatment.—Marked loss of facial expression. Spasticity and exaggerated reflexes in both arms and legs. Skin shiny and moist. Constantly salivating. Mentally dull, apathetic, and depressed. No central nerve involvement. No nystagmus. Cerebro-spinal fluid: No excess of protein. Blood: Rouleau and fibrin formation normal. Hæmoglobin, 80 per cent.; red blood corpuscles, 4,762,400; colour-index, 0·8; white blood corpuscles, 6031; polymorphonuclears, 56 per cent.; small lymphocytes, 24·5 per cent.; large lymphocytes, 2·0 per cent.; eosinophils, 0·0 per cent.; basophils, 1·0 per cent.; large hyalines, 0·5 per cent. No changes were seen in the stained red cells. Blood-sugar curve within normal limits.

Present condition (six months after treatment).—Facial expression at rest; still shows some mask-like tendency, but can now smile or frown quite easily. Both arms and legs still some degree of spasticity, but considerably less than before. Skin much drier with no sweat. No excess of saliva. Mentally much improved; is bright and cheerful.

CASE 2.—M. C., aged 31.

History.—Acute attack of encephalitis two years ago. She made an apparent complete recovery from this attack. Two years later she found that she was beginning to lose power in both hands and that she was developing tremors in them. Her mouth constantly secreted saliva and she had very great difficulty in swallowing.

Condition Prior to Treatment.—Well-marked Parkinsonian syndrome with mask-like face, inability to express any emotion, spasticity and exaggerated reflexes in all limbs, shiny skin, and unpleasant-smelling sweat. Cerebro-spinal fluid: No excess of protein. Blood: Rouleau and fibrin formation normal. Hæmoglobin, 80 per cent.; red blood corpuscles, 4,350,000; colour-index, 0·9; white blood corpuscles, 6500; polymorphonuclears, 65 per cent.; small lymphocytes, 22 per cent.; large lymphocytes, 2·5 per cent.; eosinophils, 0·0 per cent.; basophils, 1·0 per cent.; large hyalines, 0·45 per cent. No changes were seen in the stained red cells. Blood-sugar curve within normal limits.

Present Condition (six months after treatment).—Her general appearance is considerably improved in that her skin is no longer shiny and there is no strong-smelling sweat. She is able to swallow better and there is less spasticity. In spite of this apparent improvement she herself still feels ill, and a mental condition almost amounting to a degree of anxiety neurosis is still left. She is tending to relapse, and her mental condition is the most serious of all the cases treated.

CASE 3.—C. W., aged 18.

History.—An acute attack of encephalitis two years ago. He made an apparent recovery, but 18 months later noticed that he was losing power in both arms and legs, that his mouth was constantly full of saliva, and that he had considerable difficulty in swallowing.

Condition Prior to Treatment.—General rigidity of trunk. Marked bradykinesia. Excessive salivation. All reflexes exaggerated. Tremors of hands and legs. Cerebration slow. Was rapidly going downhill. Cerebro-spinal fluid: No excess of protein. Blood: Rouleau and fibrin formation normal. Hæmoglobin, 78 per cent.; red blood corpuscles, 4,600,000; colour-index, 0·8; white blood corpuscles, 6900; polymorphonuclears, 54 per cent.; small lymphocytes, 24 per cent.; large lymphocytes, 3·0 per cent.; eosinophils, 0·0 per cent.; basophils, 1·0 per cent.; large hyalines, 0·5 per cent. No changes were seen in the stained red cells. Blood-sugar curve: 0·11, 0·15, 0·195, 0·175, 0·115.

Present Condition (six months after treatment).—Up to three months ago there was an apparent improvement, but he has now started to relapse again. He is experiencing great difficulty in swallowing and has a return of the salivation and tremors.

CASE 4.—D. W., aged 31.

History.—Acute encephalitis two years previously, from which an apparent recovery was made. Eighteen months later she began to lose power in arms and legs and developed a typical Parkinsonian syndrome with a constant flow of saliva.

Condition Before Treatment.—Rigidity of trunk. Exophthalmos. Tremors (pin-rolling type) in both hands. Exaggerated reflexes. Skin shiny, covered with sour-smelling sweat. Mentally dull and apathetic; cerebration slow. Cerebro-spinal fluid: No excess of protein. Blood: Rouleau and fibrin formation normal. Hæmoglobin, 72 per cent.; red blood corpuscles, 4,300,000; colour-index, 0·8; white blood corpuscles, 7000; polymorphonuclears, 72 per cent.; small lymphocytes, 23 per cent.; large lymphocytes, 3·0 per cent.; eosinophils, 0·0 per cent.; basophils, 1·0 per cent.; large hyalines, 0·4 per cent. No changes were seen in the stained red cells. Blood-sugar curve: 0·105, 0·155, 0·17, 0·175, 0·15.

Present Condition (three months after treatment).—Saliva within normal limits. Exophthalmos reduced. No excessive sweating. Mentally brighter and cerebration not so slow. Tremors and rigidity remain unaltered.

CASE 5.—B. N., aged 10.

History.—Acute encephalitis two and a half years previously with marked inversion of sleep-rhythm. The latter gradually cleared up and merged into the Parkinsonian state with all the usual features.

Condition Prior to Treatment.—Slight rigidity of trunk and festination. Exaggerated reflexes. Tremors of hands and feet. Excess of saliva. Excess of sweat. Only just able to smile. Mentally dull and depressed; cerebration very slow. Cerebro-spinal fluid: No excess of protein. Blood: Rouleau and fibrin formation normal. Hæmoglobin, 76 per cent.; red blood corpuscles, 4,200,000; Colour-index, 0·9; white blood corpuscles, 5400; polymorphonuclears, 74 per cent.; small lymphocytes, 21·5 per cent.; large lymphocytes, 3·0 per cent.; eosinophils, 0·0 per cent.; basophils, 1·0 per cent.; large hyalines, 0·5 per cent. No changes were seen in the stained red cells. Blood-sugar curve within normal limits.

Present Condition (four months after treatment).—Saliva and sweating reduced. Considerable improvement in facial expression. Mentally brighter. Some degree of rigidity of trunk still present. Tremors present and reflexes still exaggerated.

CASE 6.—V. R., aged 16.

History.—Acute encephalitis two years ago, from which an apparent recovery was made. A year and nine months later she noticed that her mouth was constantly full of saliva. This was followed by weakness of the arms and legs, a general bowing of the trunk, and difficulty in swallowing.

Condition Prior to Treatment.—Well-marked Parkinsonian stare with exaggerated reflexes, tremors, rigidity, and cyanosis of extremities. Constant flow of saliva. Immobility of expression. Unable to feed herself. Mentally dull and depressed; cerebration very slow. Cerebro-spinal fluid: No excess of protein. Blood: Rouleau and fibrin formation normal. Hæmoglobin, 82 per cent.; red blood corpuscles, 5,500,000. Colour-index, 0·75; white blood corpuscles, 9593; polymorphonuclears, 68 per cent.; small lymphocytes, 21 per cent.; large lymphocytes, 3 per cent.; eosinophils, 0·0 per cent.; basophils, 1·5 per cent.; large hyalines, 0·5 per cent. No changes were seen in the stained red cells. Blood-sugar curve within normal limits.

Present Condition (six months after treatment).—Facial expression improved and less difficulty in swallowing. A reduction of salivation. She can now feed herself and mentally is much brighter. There are still present, however, tremors, exaggerated reflexes, and bowing of the trunk.

Conclusions.

(1) Some temporary degree of improvement is apparent in all the cases. (2) The improvement is most apparent in the decrease of salivation and sweating, quicker cerebration, and in the facial expression. (3) There is apparently some degree of improvement in the mental condition; though, all the above cases having been told that their condition was incurable, discount has to be made to a certain extent for the improvement brought about by the patient feeling that something further is being done. (4) Little or no improvement is apparent in the rigidity of the trunk, exaggerated reflexes, and tremor. (5) The actual length of time that has ensued since the onset of the disease does not, however long, necessarily indicate that no improvement can be obtained, as the case which did best had had his acute infection eight years previously. (6) There is a distinct difficulty in infecting certain cases of post-encephalitis with malaria, as several of them who had never had malaria before have been inoculated on three different occasions without fever developing. (7) It would appear that, at any rate, a further trial of this method of treatment and a more extensive investigation over a larger number of cases is justified by these results.

I should like to take this opportunity of thanking Colonel S. P. James, of the Ministry of Health, for his help and coöperation in supplying anopheles mosquitoes, and Dr. H. A. Fielden, of Torquay, for his great help on the pathological side.

A further series of cases is under treatment and will be reported on in due course together with a later report on the above cases.

CHRONIC EPIDEMIC ENCEPHALITIS:
TREATMENT BY INDUCED MALARIA.

BY P. K. McCOWAN, M.D. EDIN., M.R.C.P. LOND., D.P.M.,
AND
L. C. COOK, M.R.C.S. ENG.,
ASSISTANT MEDICAL OFFICERS, WEST PARK MENTAL HOSPITAL, EPSOM.

CHRONIC epidemic encephalitis is a disease having sufficient resemblance to general paresis to have raised the hope that, after intentional malarial infection, it might show improvement parallel to that which is undoubtedly seen in the latter disease. This is the only reason that can be put forward to justify the treatment of chronic epidemic encephalitis by induced malaria. Both diseases are chronic infective processes affecting the central nervous system, notoriously resistant to any known treatment by drugs, and, once established, sooner or later are fatal. The few references in the literature to malarial treatment of encephalitics show that only an isolated case here and there has been dealt with, and that the reports have been published before the full effect of the treatment could be definitely appraised.[1] [2] The subject was discussed last year at the October meeting of the Office International d'Hygiène Publique, and Colonel S. P. James informs us that "Dr. Chodzko, of Poland, said that an Italian had obtained marked amelioration in two out of four cases of post-encephalitic Parkinsonism, but he could not give the reference." The reports from other countries where the treatment had been tried were unfavourable.

It therefore seemed advisable to try, if possible, to decide definitely whether at last some hope of cure could be held out to the unfortunate victims of this incapacitating disease. A unique opportunity for the experiment presented itself at this hospital, as all the facilities for applying the treatment were present, and over a hundred patients were available from whom a choice could be made. The writers have had many years' experience of the treatment of general paretics by this method, and a highly trained staff was available to coöperate in the careful nursing and the making of the necessary observations so essential if the attendant risks are to be reduced to a minimum. In the case of general paretics, what we regard as a full course of treatment is that the patient should have ten rigors with rise of temperature to 104° F. or over, and it was decided that this be aimed at with the encephalitics. This is a severe test of the strength of any patient, and as encephalitics as a whole are none too robust it necessitated a very careful watch being kept on the course of the disease. This was done by clinical observation of the patient and by examinations of the blood films taken quarter-hourly during the paroxysms of fever with a view to judging the extent of blood involvement from the malarial infection.

[1] Stransky: Ars Medici, 1925, iii., 285.
[2] Weygant: Wien. Klin. Woch., 1923, No. 47, p. 2164.

The Experiments Described.

The malaria was induced by the feeding of infected mosquitoes on the patient. This method was used in preference to the inoculation of infected blood, as in this way malaria fever is definitely transmitted, whereas with inoculation we are dealing with an artificial disease which is different from the real infection in many important points which need not be dwelt upon in this paper. The only disadvantage of the method used is that the fever is not so easily controlled by quinine, and two of the present series have had relapses of their malaria.

Fifteen male patients were chosen as representing different types and stages of the disease; five of these were allowed to run a full course and had ten or more rigors with peaks of 104° F. or over, in two it was considered advisable, owing to their physical condition, to terminate their malaria after they had had eight rigors with peaks of 103° F. or over. It is on these seven cases that our conclusions are really based. One case showed signs of pulmonary mischief on the fourth day of his fever and, although quinine was promptly administered and his malaria checked as shown by blood films, he did not rally, and died three days later. Autopsy revealed extensive bronchopneumonia, but nothing to suggest that his death was due to malarial infection per se. All five patients who ran a complete course were youths between 17 and 24, and, without exception, had regular strong rigors and stood their course excellently. Even in them, however, the combined effect of the malaria and the forced inactivity incident to it led to considerable feebleness from which recovery was extremely slow. Compared with the average case of general paralysis the convalescence of these cases was very protracted, and they did not reach their pre-treatment strength for very many weeks. It seemed that the remaining seven patients had escaped infection, but after the prolonged incubation period of eight months in one case and nine months in two cases, three of these patients commenced their malarial fever.

Negative Results of Treatment.

By this time, however, we were satisfied that the treatment was in no way beneficial, and we no longer felt justified in subjecting these patients to the dangers of a prolonged course. We therefore exhibited quinine after a few days' fever, having in the meantime found malarial parasites in blood films from each case, and so proved beyond possibility of doubt the nature of their fever. These three cases, although of little importance from the point of view of the effect of malaria in encephalitics, are of considerable interest to students of malaria on account of the long incubation period of their attack. It should be noted that this was a true incubation period and not a relapse following an abortive primary attack. The temperature of these patients was taken thrice daily for six weeks following their being bitten by the mosquitoes, a period which amply covered the usual time of incubation, and even after that they were under close observation for any evidence of the commencement of malaria. All three cases were infected from the same strain of mosquitoes, as was also one of the four remaining cases who have not yet shown any signs of infection.

Conclusion.

In the short summary of each case, which is given below, no details as regards mental symptoms or neurological signs are stated, as these were entirely uninfluenced in every case. The only result of the treatment was a debilitating effect on the general health of the patients, a debility which was very prolonged owing to the poor recuperating powers of the encephalitic, and we have no hesitation in condemning malarial therapy as a thoroughly useless and unjustifiable method of treatment in these cases. It is by no means devoid of danger and, even in those cases who would appear to have recovered from its effects, it may well have left permanent traces. It may have further weakened the already poor defensive mechanism against disease of which they were possessed, and have prevented that step towards improvement which care of the general health causes in the encephalitic. It is well known that it is in early cases of general paresis that most benefit occurs from malarial therapy, and it might be objected that, owing to the comparatively advanced type of case dealt with here, a fair chance was not given to the treatment. This objection would be justifiable if advanced cases of general paresis showed no benefit following malarial treatment, or if even the slightest transient improvement had been obtained in one encephalitic patient. Neither of these propositions can be maintained, however, as we can abundantly testify. Our results are also in keeping with the results obtained from other forms of intercurrent fever in the two diseases. It is a well-established fact that in general paresis transient improvement often follows intercurrent febrile diseases, and many forms of treatment have in the past had a passing popularity because of this. In fact, the present malarial therapy was an outcome of this line of treatment. Nothing analogous to this occurs in chronic epidemic encephalitis. At different times we have treated our encephalitic patients with various forms of artificial fever therapy, and two of them have had well-developed attacks of erysipelas with hyperpyrexia, but in no case did any improvement, transient or otherwise, occur.

Summary of Cases.

P. H.—24 years, advanced Parkinsonian, bitten Jan. 12th, 1927, by one mosquito; incubation period 10 days. He had 10 peaks of over 104° F., of which the highest was 106° F. He stood his course well, but remained enfeebled from it for 2 or 3 months. Since then he has made no improvement, and is rather slower and weaker than before his treatment.

M. E.—18 years, advanced Parkinsonian, bitten Jan. 17th by two mosquitoes; incubation period 18 days; 10 peaks over 104° F., highest 107·2° F. Stood course well, convalescence slow. No change.

S. W. T.—17 years, moderate Parkinsonian, apache tendencies, bitten Jan. 17th and Feb. 5th; incubation period 14 days; 10 peaks over 104° F., highest 106° F., and 7 peaks over 103° F. Stood course well, convalescence slow. No change.

S. M.—17 years, moderate Parkinsonian, apache, bitten March 4th by two mosquitoes; incubation period 13 days; 11 peaks over 104° F., highest 107° F. Stood course well, slow recovery. No change. Malarial relapse June 12th.

C. R.—19 years, moderate Parkinsonian, bitten April 20th by five mosquitoes; incubation period 13 days; 10 peaks over 104° F., highest 105·4° F. Stood course well, recovery slow. No change.

H. S.—20 years, moderate Parkinsonian, apache, bitten April 20th by three mosquitoes; incubation period 13 days; 6 peaks over 104° F., highest 105·4° F., and 2 over 103° F. He developed slight jaundice necessitating termination of his treatment on the twelfth day. Recovery was very slow. No change.

G. H.—48 years, moderate Parkinsonian, bitten April 20th by six mosquitoes; incubation period 13 days; 5 peaks over 104° F., highest 105·2° F., 3 peaks over 103° F. He became very feeble, and it was considered advisable to intervene on the eighth day. Recovery was extremely slow and he has never altogether regained his lost ground.

H. W.—39 years, moderate Parkinsonian, bitten April 20th by three mosquitoes; incubation period 13 days; temperature remained elevated. Became cyanosed, respiration and pulse rapid. Malaria stopped on fourth day, but bronchopneumonia intervened and death took place three days later.

In conclusion, we would thank the medical superintendent of West Park Mental Hospital, Dr. Norcliffe Roberts, for permission to publish our results, and Colonel James for directing our attention to the foreign literature of the subject.

THYROID MEDICATION IN SKIN DISEASE.*

BY P. B. MUMFORD, M.D. MANCH., M.R.C.P. LOND.,

ASSISTANT MEDICAL OFFICER, MANCHESTER AND SALFORD HOSPITAL FOR DISEASES OF THE SKIN; ASSISTANT TO THE DERMATOLOGIST, ROYAL INFIRMARY, MANCHESTER; VISITING PATHOLOGIST, PARKSIDE MENTAL HOSPITAL.

THE administration of thyroid by the mouth has been used with varying success by many workers for almost every disease of the skin. Owing to its frequent failure to produce amelioration, its use has fallen into disrepute of recent years. The failure may perhaps have been due to lack of care in picking suitable cases, and also to the absence of any recognised criteria by which cases for thyroid medication should be chosen.

Increase of thyroid hormone in the blood stream causes: (1) an increased metabolism of the skin; (2) an increased superficial and peripheral circulation; and (3) an increased vascular response to irritant. These three results, all interdependent, would be of great value in combating the progress of many chronic diseases of the skin, were it not for the many contra-indications to its routine use.

Thyroid may be given in three groups of skin diseases: (1) Where there is definite evidence of subactivity of this particular gland—e.g., the xerodermia of myxœdema. (2) Where there is no evidence of gross glandular subactivity, but in which the effects of thyroid medication may be expected to remove the causes, or relieve the results, of the skin disability. These are cases in which thyroid "poisoning" forms a method of treatment—e.g., certain cases of pernio. (3) Diseases due to some obscure disorder of metabolism in which a general increase of vital processes may be expected to remove the causative agent—e.g., certain cases of chronic urticaria.

These groups may now be studied in detail with examples.

Subactivity of the Thyroid.

Group 1.—Where there is definite evidence of subthyroidism, the dry, harsh skin of a true case of myxœdema, or the less dry skin of a patient definitely suffering from reduced thyroid activity, will yield to thyroid medication in nearly every case, and a week or two of comparatively mild doses of the gland will give marked improvement. Whenever a skin disease, even one of unknown ætiology, is found in a patient who is mentally slow, has a sluggish pulse, a dry skin, a partial diffuse alopecia, or other symptoms suggestive of subthyroidism, then treatment by the gland may be rationally employed, and surprisingly successful results often follow. In a case of epidermolysis bullosa where there was definite general evidence of such subactivity, thyroid medication was found not only to give a lasting cure, but also a marked improvement in general symptoms. In other cases of epidermolysis bullosa thyroid has proved valueless. This particular case was complicated by deficiency of secretion, and it may have been that the readjustment of this function was accompanied by the removal of some unrecognised ætiological factor.

O. Gans quotes a case of a 3-year-old child with a dry, infected, and malnourished skin, in whom thyroid extract alone gave a cure. W. Falta quotes a case of severe irritation in a patient whose skin was "thick, cool, and cyanotic," and did not show any sensible perspiration. Glandular extract produced a smooth, elastic, and healthy skin free from itching. E. Hertoghe quotes cases of chronic eczema with thick, infiltrated skins, who manifested signs of reduced thyroid activity and whose lesions yielded to thyroid medication. A chronic type of urticaria may be found in true myxœdema and in cases suggesting a mild form of the disease. Relief following thyroid medication may be due to the direct effect of the gland on the skin or to the removal from some other part of the system of an agent causing the urticaria. M. L. Ravitch[1] quotes nine cases of chronic urticaria cured by thyroid medication.

Malcolm Morris,[2] in a paper on the internal secretions in relation to dermatology, referred to the use of thyroid for a very wide range of diseases of the skin. He concludes that it is of greatest therapeutic value where there are certain evidences of reduced activity of the gland, such as chronic rheumatism, obesity, and mild dryness of the skin. He found it of value in chronic psoriatics who manifested these symptoms. He suggested that it might also be employed with success in the eczema of over-fat babies and in ichthyosis.

Thyroid medication will often produce improvement in general symptoms as well as local symptoms, especially at the menopause. Cases occur where thyroid medication produces an increase of weight, improved mental condition, a brighter and happier outlook on life, and an improvement in the health of the skin in particular. Such cases appear to be in specific need of thyroid. The increase of weight is not altogether an anomaly; it is probable that the relief of the skin irritation and the increased comfort resulting are potent factors in improving the general health and physique of the patient.

Cases for "Thyroid Poisoning."

Group 2.—In this group an attempt is made to combat manifestations of disease by mild thyroid poisoning. Amongst the results of this will be decrease of peripheral tone and increase of sweating, of sebaceous activity, and of skin metabolism. If any of these latter are thought likely to counteract the results of the skin disease, then thyroid medication may be rationally employed. (Thyroid medication may, however, promote a disease which is already associated with sweating or with erythema of arterial origin.) It is possible that chilblains are in part due to an exaggerated physiological response to cold by the superficial blood-vessels. Thyroid medication relaxes peripheral tone and gives a general physiological dilatation of vessels secondary to raised metabolism; it counteracts to some extent the arteriolar spasm, which is one of the causative agents of the pernio lesion. Treatment of chilblains by thyroid extract is, in picked cases, rational rather than empirical.

In skin conditions where there is general infiltration and thickening in the absence of any definite underactivity of the thyroid, administration of the gland may produce improvement by increasing superficial circulation and nutrition. Very minute doses may bring this about; in one case, with an extraordinary sensitivity to thyroid, improvement ensued in the skin, although acute thyroid poisoning followed ¼ gr. thyroid gland three times daily. Byrom Bramwell,[3] after accidentally producing a general exfoliation from thyroid poisoning, had a number of almost miraculous cures of psoriasis. His results were produced in one case at least by the development of a marked hyperthyroidism.

There are several conditions of the skin grouped rather loosely under the headings of "ichthyosis" and "xerodermia." In many of these thyroid medication is of some value, though occasionally it is definitely contra-indicated by other characteristics. All degrees of dryness are found in human skin varying from a mild follicular hyperkeratosis confined to the posterior border of the upper arm—a condition frequently associated with an impaired peripheral circulation—to a general thickening and dryness of the skin of the whole body. Amongst these groups is a class of individual having an "ichthyoid" skin, best described as leathery in texture, in whom grease secretion is little diminished, though the perspiration may be reduced. These persons are usually free from any general disorder of the skin, and it is only an outside observer who realises that they are abnormal. They may, however, manifest

* Based on a paper read before the Bolton Medical Society.

intercurrent diseases of the skin, and may respond to thyroid medication because of an improvement in the basis on which the disease occurs. This applies particularly to patients in whom perspiration is diminished.

In all degrees of peripheral dryness thyroid medication may be of value. The disadvantage of a routine treatment on these lines is that it occasionally induces a temporary attack of hyperthyroidism with consequent distress. Thyroid therapy may be contra-indicated by cardiac, metabolic, or digestive disorder. The skin condition may be relieved, but the other manifestations are sufficiently severe to prevent further treatment by thyroid. Some cases develop signs of overdosage before there is any relief of skin symptoms. G. R. Murray[4] suggested that there might be a certain constituent ingredient of the gland with particular influence on skin metabolism. Definite proof of this has not been forthcoming, although it is clinically common to find a typical skin remaining in myxœdema patients who, under thyroid medication, have demonstrated tachycardia, diarrhœa, loss of weight, and other evidences of overdosage. Falta suggests that "dysthyroidism" does not exist, but that these anomalies are due to a varying type of response in different individuals—one responding easily to treatment of obesity, though poorly to treatment of xerodermia.

Skin conditions usually associated with myxœdema may be found in individuals who have no such deficiency. Falta quotes several cases of apparently typical myxœdematous skins in persons of normal glandular activity. Such cases do not react well to thyroid medication.

Provided the action of the gland could be confined to local effects, its use would be much wider than at present, but treatment of skin conditions with thyroid gland to the point of poisoning is hardly justifiable. It is to be noted that Bramwell, who was the first to introduce this treatment for psoriasis, states that a pulse of 130 is by no means a contra-indication. In view of recent work on the possibility of producing diabetes or exophthalmic goitre by excessive dosage, such a pulse would to-day prevent the further administration of thyroid. He concludes his remarks by saying that thyroid medication of psoriasis will occasionally give a brilliant result, often improve the condition, and sometimes have no effect. Subsequent work has done little to disprove these conclusions. I have noted that psoriasis can exist in the presence of Graves's disease, and it seems clear that treatment of psoriasis by thyroid gland is by no means specific.

Metabolic Disorders.

Group 3.—The third and very indefinite group of diseases of the skin which may be treated by thyroid gland consists of certain diseases of obscure ætiology which may be associated with internal derangement of metabolism. Such derangements are occasionally remedied by the direct effect of the gland. For example, it is likely that certain diseases of the skin are due to intestinal irritation or to absorption of unusual products of digestion, factors known to affect the superficial vascular system. They may result from chronic constipation; thyroid extract increases intestinal peristalsis, and so may directly remove the causes of disease. A case is quoted by A. Fabini in which chronic urticaria of nine years' standing was removed by thyroid medication. A nurse (E. K.) under the author's care showed chronic urticaria and also signs suggestive of thyroid deficiency. She was relieved of both by thyroid medication. Whether the relief of the urticaria was due to the relief of constipation by the gland, or whether to a specific vascular effect, it is impossible to say.

Cases of localised sclerodermia sometimes show a marked improvement under this treatment; such results are either coincidence or due to the removal of a quite unrecognised ætiological factor. A local and specific effect on the area of skin involved is unlikely. Many cases of sclerodermia are reported as coexisting with glandular hyperactivity (Falta).

There does not seem to be any rational basis for the treatment of such conditions as lupus vulgaris by thyroid extract, except in so far as the general effects exercised by the gland on the system may improve the general condition of the individual.

Dosage.

The dosage of thyroid will depend on the age, weight, and condition of the patient, and the degree, if any, of subthyroidism present. An adult with slight myxœdema should commence with gr. 3 of the dried extract daily; an adult showing little or no clinical evidence of glandular deficiency can take gr. 1½ daily without danger. The dose is very slowly increased at monthly intervals until there are manifestations of slightly excessive intake or signs of improvement in the skin. The weight and pulse-rate should be taken weekly and noted on the patient's history sheet.

Some patients are sensitive to thyroid gland, even gr. ½ being excessive. In such cases the dose must be much reduced if the treatment is to be continued. A very minute dose may be sufficient to improve the skin condition without giving any discomfort.

Prognosis.

Prognostic points are:—

(*a*) Skin diseases with an onset at any of the transitional periods of life, such as puberty and menopause, are often temporary, and in part due to alteration of thyroid activity, balance being reassumed later.

(*b*) If thyroid medication proved of value in the early stages of treatment then prognosis, if thyroid is continued, is good. The gland can be taken in small doses over long periods without risk.

(*c*) In ichthyotic skins where there are signs of general hypothyroidism, and particularly if there is absence of sweating, a good prognosis may be made. Where sweating occurs normally, the prognosis for the disease for thyroid medication is generally poor.

(*d*) In children, if thyroid medication is beneficial, there is often good prospect of improvement at puberty.

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A NOTE ON THE AMBULATORY TREATMENT OF VARICOSE ULCERS.

BY JAMES DEVANE, M.B. DUB., D.P.H.,
PHYSICIAN, ST. ANNE'S SKIN AND CANCER HOSPITAL, DUBLIN.

To the general practitioner a reliable method of treating varicose ulcers must be a subject of more than passing interest. A new method of approach to the Gasserian ganglion is a theme for the elect, but a new method of treating varicose ulcers has an appeal to every doctor. Varicose ulcers and the poor are always with us.

I have had clinical experience extending over 100 cases of the various modern methods of treatment of varicose ulcers, and in every case have seen results immeasurably better than the old lint and zinc oxide therapy. Modern treatment depends on two factors: support to the flaccid vessels and extra support at the point of lowest vitality—the site of the ulcer itself.

The varicose ulcer is due to venous stasis, and, as a consequence, impaired nutrition, with often a superimposed bacterial infection. It is at once a local and a systemic manifestation, and to get results local and systemic therapy must both be employed. Assuming the obvious natural therapeutic agents of

food, air, and intestinal disinfection, the essential treatment is first to ensure as much local sterility as possible, then to give support to the vessels of the leg, and finally to give extra support to that point where the tissues are weakest and have broken down —the ulcer itself.

To effect this I have tried the following methods. (The leg in each case has been washed in hot soap and water or some bland antiseptic from the toes to the knee. The surface of the ulcer has been cleared of slough and débris; the edges and the base, where necessary, touched up with caustic.)

1. Dress ulcer with a suitable medicament such as zinc, iodoform, or neoform; place a few layers of sterile gauze over the ulcer, and on top of this, extending over the edges of the ulcer, sterile lint. Bind leg with crêpe bandage from middle of foot to knee.

2. Dress ulcer as above. Instead of lint use a rubber sponge to extend half an inch all around edges of ulcer, and use crêpe bandage as above.

3. Proceed as in 1 and 2; use a zinc glue bandage instead of crêpe.

4. Unna's paste dressing as described below, with or without sponge, and with or without window opening.

Of all these methods I have found the Unna's paste method to give the best results. The method takes time, but will repay the energy expended. The most intractable varicose ulcer will heal. The patient will not lose one day's work, will not stay one day in bed, and will feel a distinct improvement from the moment the first dressing is put on. This is the method:—

1. Cleanse leg well with warm water and soap. Cleanse ulcer with mild antiseptic, separate sloughs. Touch up edges where necessary with caustic.

2. Elevate the leg. Allow heel to rest on a block for some minutes.

3. Pack ulcer with ung. zinc. ox. until zinc. ox. and surrounding skin are on same level.

4. Cover ulcer with three or four layers of sterile gauze.

5. In some cases place some layers of sterile lint *over* the gauze, and in other cases place a thin layer of rubber sponge *over* the gauze. This extra support is indicated where discharge is not too copious. It is better, however, to omit 5 until some experience has been gained and pass from 4 to 6.

6. With a brush paint the leg from the middle of the foot up to within a few inches of the knee with Unna's paste. In this stage the gauze covering the ulcer is painted with the paste.

7. Commencing from the middle of the foot, roll an ordinary two and a half inch cotton bandage from the middle of the foot to within a few fingers-breadth of the knee-joint. As each turn of the bandage is rolled it should be painted with Unna's paste all around.

8. Allow Unna's paste to dry.

9. If there be no pain, no obstruction-symptoms (i.e., swelling, numbness, discoloration, &c., of the foot), no excessive discharge, allow the bandage to remain on for one week. If there be any of these symptoms take down the bandage and repeat process when symptoms have gone.

10. The second similar dressing, in the absence of any of the symptoms mentioned, might remain on for two weeks.

11. The third similar dressing for three weeks. At this period even the most recalcitrant ulcer should be well on the way to recovery.

It is scarcely necessary to add that Unna's paste is solid when supplied by the chemist, and should be brought into solution by placing it over steam, or placing the jar which contains it in a vessel of boiling water.

By this method we ensure: (*a*) That the leg and ulcer are not contaminated from outside by daily handling, dirty lint, and creviced loose bandage. (*b*) That we get equal traction along the whole leg and that the vessels get adequate support. (*c*) That the ulcer itself is under extra pressure and is bathed in mollifying zinc.

To simplify the routine dressings, I have recently experimented with a bandage of my own which will eliminate the tedious painting with the Unna's paste, and will, I hope, give just as good results. I have not, however, tried a sufficient number of cases to write with authority on this method.

Clinical and Laboratory Notes.

A NOTE ON ULTRA-VIOLET RADIATION IN THE TREATMENT OF HERPES.

BY M. WEINBREN, M.R.C.S. ENG., B.SC. S. AFRICA, D.M.R.E. CAMB.,

MEDICAL OFFICER IN CHARGE OF THE X RAY AND ULTRA-VIOLET DEPARTMENTS, QUEEN'S HOSPITAL, FROGNAL, SIDCUP; HON. ACTINOTHERAPIST, MOUNT VERNON HOSPITAL.

THE treatment of herpes in its various forms by ultra-violet rays has been advocated in most of the books dealing with ultra-violet therapy. Although none of the authors have published large series of cases, all record good results in the cases they have treated, some actually claiming to have aborted herpes in the early stages. All have used the mercury [1] vapour lamp, air-cooled for treatment and water-cooled for aborting attacks. The dose advocated varies; Plank [2] recommends blistering, although he reports a case which improved rapidly without such vigorous treatment. Others suggest doses which would correspond to a second or third degree erythema.[3 4]

It is not easy to collect long series of cases of herpes, nor is it always possible to be certain that the particular treatment given was actually responsible for the improvement. There is, however, little doubt that ultra-violet treatment was of benefit in the nine cases I have treated, of which the three following are typical.

CASE 1.—Five weeks after a course of stovarsol and auremetine for amœbic dysentery the patient began to complain of itching in the left groin and noticed a number of vesicles. The itching was so intense that it kept him awake the whole of the first night and he said that he could not bear anything touching the skin. He was given five minutes at two feet with the air-cooled Hanovia lamp (a second degree erythema). This dose was repeated every day for four days. The first exposure relieved the itching and the next day there were fewer vesicles. After the fourth exposure all the vesicles disappeared; there was no itching and there was no scarring of the skin. The stovarsol was probably not responsible for the herpes in this case.

A control case, not treated with ultra-violet rays, occurred in the hospital at the same time and with very similar distribution, and the vesicles and itching persisted for three weeks. The patient had previously been given a course of ultra-violet treatment and his skin had become well pigmented. He was not on ultra-violet treatment at the time of the attack of herpes. Serious scarring resulted.

CASE 2.—The attack of herpes zoster came on during a course of ultra-violet treatment for anæmia. He was not receiving any arsenical drugs at the time. As a large area was affected, the opportunity was taken of observing the effect of doses of different intensity. Part of the area was treated with the "Alpine Sun," the other part with the "Kromayer." Very heavy doses from both lamps were necessary to obtain any reaction, his skin being well pigmented as the result of his general ultra-violet treatment from the carbon arc. Three days after the first exposure most of the vesicles had disappeared, but there was still some irritation. The Kromayer only was then used to relieve the irritation, which cleared up with three more exposures. The heavier doses from the Kromayer were more effective than the doses from the Alpine Sun. There was no scarring or neuralgic pain after the treatment.

CASE 3.—A woman with a patch of herpes zoster was sent to the light department at the Mount Vernon Hospital by Dr. J. F. Halls Daily. The vesicles had been present four weeks and the patient was complaining of considerable discomfort which disturbed her sleep. One minute from a new Kromayer lamp in contact (heavy third degree erythema) removed the vesicles and relieved the discomfort. The dose was repeated only once two days later, and all discomfort ceased.

Three more cases were treated on similar lines with similar results. In these the herpes was not so severe, however, as in the cases described, and it is possible that they would have improved rapidly in any case.

As far as it is possible to draw conclusions from these few cases it would appear that: (1) general

ultra-violet treatment will not prevent the onset of herpes, nor will the pigmented skin prevent the appearance of vesicles or scarring (Cases 2 and 3); (2) local ultra-violet radiation will remove the vesicles and relieve the accompanying discomfort; (3) heavy doses are more effective.

I am indebted to the Director-General of Medical Services, Ministry of Pensions, for permission to publish this note.

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THREE CASES OF ETHMOID DISEASE.

BY WALTER BROADBENT, M.D. CAMB., F.R.C.P. LOND.,

SENIOR PHYSICIAN TO ROYAL SUSSEX COUNTY HOSPITAL; CONSULTING PHYSICIAN TO ROYAL ALEXANDRA HOSPITAL FOR CHILDREN.

THE ethmoid and sphenoid sinuses are so deeply situated, and so difficult to get at, that inflammation in them is often not thought of as a possible cause of headaches. Such headaches are generally referred to the back of the head or are said to be deep in it. If pus is pent up in these cells, any extra infection may lead to a fatal meningitis, as the following cases show.

CASE 1.—A girl of 7 was suddenly taken ill with headache and vomiting and was very feverish. The next two days she was thought to be better by her mother, as she did not vomit, but she still had headache. On the fourth day she was delirious, so a doctor was called in, who at once sent her into hospital.

On admission her temperature was 101·6° F. There were sordes on the teeth and the tongue was furred and brown. She had much pain in the head. Though there was no actual retraction of the neck, the chin could not be got within 2 inches of the chest. Kernig's sign was well marked. The right toe reflex was extensor. There was no tenderness over the mastoids, and the ear-drums were normal. The pharynx and tonsils were red and swollen, but there was no secretion on them. There was no nasal discharge. There were no abnormal physical signs in the lungs, abdomen, or heart. On lumbar puncture turbid fluid under pressure was obtained, which contained very numerous pneumococci. She was given 5 gr. of urotropine four-hourly, and hypodermic antipneumococcic serum, but she died on the fourth day after admission.

Post mortem the lungs and other organs were quite normal. On opening the skull there was a meningitis spreading all over the brain, most severe in front of the pons. Both mastoids were opened and found to be normal. The dura mater over the right ethmoid was injected, and, when the bone underneath was cut into, it was red and inflamed. In the right ethmoid cells there was thick pus, evidently the origin of the meningitis.

CASE 2.—A man of 25 was admitted to hospital under me some years ago for headache, which he had had on and off for some time, but it had become worse lately, keeping him awake. There was no retraction of the neck and no Kernig's sign. His temperature and pulse were normal. His tongue was very furred. There was no albuminuria. A few days after a patient was admitted to the next bed with an acute streptococcal infection of the throat. The next day the man had a sore-throat, and his temperature rose to 100° F., the headache also becoming much worse. Two days later the neck was rigid, and Kernig's sign was present for the first time. Some swelling of the temporal and pre-auricular region on the right side was noted. Lumbar puncture gave a cloudy fluid, from which abundant streptococci were grown. On the following day there was swelling of both temporal and pre-auricular regions, more marked on the right side, and œdema of the eyelids as well. There was no nasal discharge. At the post-mortem there was extensive inflammation of the sphenoid bone and pus in the sphenoid and ethmoid sinuses, as well as a streptococcal meningitis. Evidently the headaches had been due to pus in the sphenoid and ethmoid sinuses, and the infection from the throat had lighted up a streptococcal inflammation of the bone and meninges. The œdema of the temporal and orbital regions was probably caused by blocking of the orbital veins and lymphatics by the inflammation of the sphenoid bone.

CASE 3.—A boy of 7 was admitted to hospital with marked proptosis of the right eye, the swelling having only begun a week before. The conjunctiva was bloodshot, and, on examining the optic disc, it was seen to be œdematous. There did not seem to be much pain. There was no nasal discharge. The whole contents of the orbit projected a good half inch in front of the level of the eyebrow, as if there was a tumour at the back of the orbit, but the swelling had all occurred in a week. The temperature was 99·6° F., and the pulse-rate 96. On blood examination there was a leucocytosis of 17,000.

I asked Mr. Fitzmaurice Kelly to see the case and explore the orbit. On making an incision on the inner side above the eyeball, he found pus over the ethmoid bone. He then lifted the periosteum and dissected it back, and opened the ethmoid sinus, which was full of pus. The proptosis soon went down, but it took some time for the sinus to close.

Another case may have been due to ethmoid disease. A lady, who had for a long time been subject to deep-seated headaches, was suddenly taken acutely ill with intense headache, vomiting, a temperature of 102·5° F., and a pulse-rate of 80. When she was seen next day in consultation there was marked evidence of intracranial pressure; her head could not be bent forwards and Kernig's sign was present. There was some tenderness on pressure just below the left eye. I was so convinced that this was another case of ethmoid disease that I asked that the sinuses should be explored. This was done the next day by a London specialist, who, however, said that he found no pus in the ethmoid or sphenoid sinuses, but the following day the temperature had come down, the headache was much less, the vomiting had stopped. The meningeal signs quickly cleared up and the patient got well. The pus in the ethmoid sinus in the first case, in which the patient died of meningitis, was so thick that it would not have flowed out if the sinus had been opened from the nose, and it seems to me possible that such pus might have been present under pressure in the last case, and the opening of the ethmoid sinus may have relieved the tension without, at the moment, causing pus to flow.

Public Health Services.

REPORTS OF MEDICAL OFFICERS OF HEALTH

THE following are some 1926 statistics of six districts:—

Name of district and estimated mid-year population.	Birth-rate.	Death-rates per 1000 of the population.					Death-rates per 1000 births.		
		All causes.	Tuberculosis.	Cancer.	Respiratory diseases with influenza.	Heart disease.	Diarrhœa under 2 years.	Infant mortality.	Maternal mortality from childbirth.
Newcastle-on-Tyne (284,700)	21·0	12·8	1·46	1·16	2·2	1·5	14·1	88	3·1
Cardiff (225,700)	20·1	10·8	1·27	1·14	1·6	1·6	8·8	60	5·3
Ipswich (84,140)	18·3	10·3	0·82	1·24	2·0	1·2*	3·9	45	5·8
Gillingham (47,820)	16·4	11·3	1·25	1·25	1·5	1·7	7·4	53	4·3
Barry (40,550)	20·3	9·9	1·06	1·20	1·6	1·1	12·1	65	3·6
Sheerness (16,590)	17·7	12·5	0·90	0·90	2·0	2·3	13·0	55	0·0

* Average of six years, 1921–26.

Newcastle-upon-Tyne.

Dr. Harold Kerr expresses the opinion that the population of the city did not suffer in health in consequence of the strike. This fortunate state of affairs was due to the excellent relief arrangements.

As one example, seven and a half more tons of free dried milk and two tons more of cost-price dried milk were supplied than in the previous year. The effect of the strike was also evident in the sunshine records. Thus at the Armstrong College 1085 hours of bright sunshine were registered as compared with 934 in 1925, whereas at the other station at Cockle Park some miles north of the city and in a rural area, 1449 hours were registered as compared with 1461 in the previous year. The clarity of the atmosphere in the town would have been greater still in 1926 but for the fact that much of the coal burnt was of grossly inferior quality. Dr. Kerr goes on to point out that much of the atmospheric pollution for which Newcastle has a bad name comes from the south of the river, and he welcomes the recent move for the formation of a regional smoke committee for Tyneside. He also points out that the city's tramways' power station contributes more than its fair share of smoke and handicaps the health department in dealing with other offenders. The general death-rate is the lowest on record. The towns in the north of England, however, owing to a greater density of the population and a greater shortage of dwellings compare unfavourably with the towns in the south. During the present year (1927) the University of Durham College of Medicine has taken steps to form a cancer investigation committee for the counties of Northumberland and Durham and for Newcastle-upon-Tyne. Fifty cases of small-pox were notified, some of them acute, but there were no deaths. Infantile vaccinations fell from 64 per cent. to 59 per cent. in 1926, but vaccination was "practically never refused by contacts."

There was one outbreak of suspected food poisoning, with three recognised cases and two deaths. Bacteriological examination revealed the presence of the dysentery (Flexner) bacillus in one of the fatal cases and in the intestinal contents of the patient who recovered. The same bacillus was identified in the case of three other members of the household who suffered no characteristic symptoms. Of seven patients with acute poliomyelitis, all survived, but two were left with permanent paralysis. Of three patients with cerebro-spinal fever two died, and eight of 24 cases of encephalitis lethargica were fatal. On June 26th Dr. Neil Maclay, the visiting oto-rhinologist of the city hospital, died suddenly. His work since 1921 had been an unqualified success in shortening the stay of patients in the hospital and in preventing deafness. Dr. W. Frank Wilson has been appointed in his stead.

Scarlet fever antitoxin has been administered to 78 patients with severe attacks. "If given at an early stage, the effect is almost magical, temperature falling rapidly, toxic symptoms disappearing, and general improvement occurring within 24 to 36 hours of the injection." A mercury-vapour lamp has been installed and has proved a success in promoting the convalescence of fever patients. Sickness among the nursing staff was heavy during the year. There were seven cases of scarlet fever and six of appendicitis. There were no cases of enteric fever or diphtheria, against which the nurses are protected by inoculation. Of the 56 city cases of ophthalmia neonatorum 1 died, 54 recovered completely, and in 1 baby the sight of one eye was left slightly defective. There are 348 registered blind persons in Newcastle, of whom 76 are stated to have been blind from birth, but there is only one blind child under 5 years of age. The infant mortality-rate of 88 is the lowest yet attained. The Byker ward had a rate of 130, while that in Jesmond was only 40. Dr. Kerr points out that nearly half the deaths of infants are due to causes operating before birth, hence the importance of the antenatal clinics. There were 376 antenatal sessions in 1926 as compared with 319 in 1925. During the last five years the new cases attending the sessions have increased from 252 in 1922 to 1015 in 1926. The total number of births during 1926 was 6007. Dr. Kerr claims that the comparatively low maternal mortality from childbirth is largely due to the Princess Mary Maternity Hospital. The births in Newcastle are attended in about equal proportions by doctors, midwives, and this maternity hospital. As regards tuberculosis, Dr. Kerr considers that the prolonged period of industrial depression has interrupted the decline in the mortality from pulmonary tuberculosis, but that the greater attention now given to milk is causing the decline in the rate from non-pulmonary tuberculosis to continue. Out of 376 samples of milk examined for tubercle 15, or 4 per cent., were found to be infected. About 10 per cent. of the samples from Cumberland proved to be tuberculous. The new milk legislation has not as yet produced regular inspection of milk herds by county councils, but it has, at any rate, resulted in a thorough search being made for offending cows when tuberculous milk is reported. The cow population of the city includes only about 410 milch cows, seven of which were found to be tuberculous during 1926.

For some years Newcastle has insisted on the rinsing of empty milk churns before they are returned to the farmer. This has now become a legal requirement under the Order of 1926. About 24,000 churns were examined on the railway stations during 1926 and only 64, or 0·3 per cent., were found to be unrinsed. Of 3005 empty churns passing through Newcastle from retailers to farmers outside the city 47, or 1·5 per cent., were found to be unrinsed.

The wards in the city hospital used for advanced cases of tuberculosis are kept fully occupied, but this is not the case with the beds at the corporation sanatorium at Barrasford, owing to the difficulty in getting early cases. The corporation give precedence in the allocation of their houses to families affected with tuberculosis. In some cases, when the "tuberculous" family cannot afford to pay the rent, the preference is given to persons who have had to live in the same house, or the tuberculous family is given a better house vacated by an ingoing corporation tenant. An approved scheme for a public abattoir has been held up owing to financial stringency. Owing to the housing shortage "unfit" houses cannot be closed. During 1926, 441 corporation houses were completed, and at the end of the year 1854 were in course of erection. About 400 of these, however, were "compensatory" for houses demolished under improvement schemes. The demolition of houses in the three condemned areas goes slowly on, as the compensatory houses are completed. Up to the present the dispossessed occupants of the condemned areas "are revelling in the immense improvements in their conditions and by their care of their new homes and gardens are exhibiting all the symptoms of newly developed house-pride. Also, in spite of the hard times, there are very few arrears of rent."

Cardiff.

Dr. Ralph M. F. Picken's health report opens with a chart showing how the various branches of his department are arranged. There are seven assistant medical officers on the staff, none of whom devotes his or her whole time to any one section. The Newcastle report also opened with a similar chart, but in that case the medical officer of health is not school medical officer and there is not the same unification as in Cardiff. Dr. Picken says the low mortality of 1926 must be regarded as largely due to the absence of respiratory catarrh. One wave of influenza had just spent itself before 1926 came in and another became manifest in the first week of 1927. The inadequacy of the hospital accommodation for advanced infectious cases of tuberculosis in Cardiff and East Glamorgan has been considered by the Welsh National Memorial Association. Dr. Picken points out that Cardiff has not been receiving bed accommodation in proportion to its payment to the funds of the association. An investigation has been made of the place of birth of tuberculous patients and their parents with a view to arriving at conclusions with regard to the acquisition of immunity. According to one theory children brought up in a town acquire a certain degree of immunity by exposure to small doses of infection.

According to another, they inherit resistance from immune ancestors who have been the fittest to survive in unfavourable urban conditions; 80·2 per cent. of non-pulmonary cases were Cardiff born, while 61 per cent. of pulmonary cases were Cardiff born, and 84·8 per cent. of pulmonary cases were urban born. The percentage of Cardiff born parents was 42·2 for non-pulmonary and 21·4 for pulmonary cases. The smallness of the percentage in the case of the parents is explained by the rapid growth of Cardiff until quite recently. The fate of the infants born in tuberculous households has also been studied. Of 77 such infants born in 1926, 55 were found to be healthy in June, 1927, 6 were delicate, and 6 could not be traced. Ten had died, one from tuberculous meningitis, one from tuberculosis of the intestines, and the remainder from non-tuberculous causes. The foregoing are the crude figures of a much bigger investigation which it is hoped will be carried out.

Owing to an alarming outbreak of diphtheria, immunisation was carried out at three schools. Out of 1799 children under 10 years of age 579 were Schick-tested, 418 were positive, and 415 were immunised. Out of 578 children over 10, 174 were tested; 87 proved positive and 87 were immunised. Forty-four children under school age living near one of the schools were also immunised. No child who had had time to react to inoculation had developed diphtheria up to the date of writing. The number of first attendances at the two antenatal clinics was 865 and the births in 1926 were 4537. Some particulars were obtained of 771 expectant mothers (244 of them primigravidæ) who attended for the first time during 1926; 336 were confined in private dwellings, 358 in the maternity hospital, 23 in other nursing homes, 12 had miscarriages, in 2 cases the mother died before confinement, 2 were confined elsewhere than Cardiff, and 38 were not traced. More than half were confined away from their own homes and more than half required treatment for some defect. The crippled children under school age attending the orthopædic clinic number 201, and included 48 crippled by poliomyelitis, 11 by other palsy, 32 by congenital malformations, and 82 by rickets. The special venereal diseases centre for mothers and children was opened in February, 1926, and treated 63 cases of syphilis and 84 of gonorrhœa. This centre receives its cases chiefly from the antenatal, child welfare and school clinics. At the antenatal clinic a Wassermann test is done on each new patient. Another source of cases is the following up of ophthalmia neonatorum. It is found that the expectant mothers attend well, but after the birth of a healthy baby postnatal attendance is not so satisfactory. Of the 93 cases of ophthalmia notified 83 had unimpaired vision, 1 was blinded in the left eye, 7 died from other causes, and 2 left the district. House building proceeded faster during the year, but the overcrowding found by the staff of the health department "shows little or no abatement." Daily measurements of the ultra-violet radiation have been taken since May, 1926, which indicate that its amount is nearly ten times as great in midsummer as in midwinter.

Dr. Picken draws attention to the extremely unsatisfactory type of receptacle usually provided by householders for refuse. Leaving out the corporation housing estate, covered galvanised bins are only provided for 8·9 per cent. of the houses. There is a further percentage of 3·6 uncovered bins, and the remainder of the receptacles "consist of buckets, boxes, baths, &c."

Ipswich.

Dr. A. M. N. Pringle points out that in pre-war days there was a housing surplus of sufficient size to keep rents from advancing out of proportion to the capacity of the people to pay and so to permit of the population stepping upward from poorer to better houses. Now this surplus does not exist, the "stepping" process has stopped, and the worst houses are the most crowded. The slums are filled with people who cannot escape because of the stoppage of the population movement, and who are there in addition to the habitual slum-dwellers. In discussing the decline of tuberculosis, Dr. Pringle points out that the fall began long before the Public Health Act of 1875, and that its essential cause is to be found in the production of races immune to tuberculosis. An antenatal clinic is held once a week. The number of cases who attended during the last three years were 27, 61, and 123 respectively, whilst the births for 1926 numbered 1540.

Gillingham.

Dr. W. A. Muir reports that 50 per cent. of the children born attend the infant welfare centre at least once. The number of houses completed during the year was 203, the largest number for many years. The shortage of houses, however, continues. It is estimated that 200 new houses are needed annually to cope with the increase of the population and to replace demolished and dilapidated property. This estimated annual number has now been reached, but the leeway of the war and post-war years remains to be overtaken. The corporation have made an arrangement for the use of the joint hospital at Rochester for isolation purposes. The policy is adopted of domiciliary treatment of scarlet fever, except in severe cases and where the premises are used for business purposes. There was a sudden outbreak of diphtheria in December, largely in connexion with St. Mary's school. An examination of all the pupils resulted in the discovery of one boy with severe nasal diphtheria. The closure of the school before the Christmas holidays apparently ended the outbreak. There is no municipal maternity home, but 26 civilian cases were sent into the naval maternity home through the health department during the year. The corporation have not yet provided institutional treatment or the services of an obstetric specialist for puerperal fever. A number of small shops now retail sterilised milk in sealed bottles, and Dr. Muir thinks these shops should be regarded as "dairies" for the purposes of the new Milk Act. He also criticises the exemption from the milk order of persons who keep a cow or two for domestic use but occasionally sell surplus milk. Thirty samples of milk were examined for sediment by Sutherland Thomson and Co.'s sediment tester. Nine were classed as clean, ten as fairly clean, eight as dirty, and three as very dirty. The retailer is allowed to see the pad of cotton-wool through which the milk has been poured to illustrate the necessity of taking measures to ensure a cleaner supply.

Barry.

Dr. Percy W. Kent reports that the inhabitants are largely employed at the docks in connexion with the export of coal. The coal strike suspended the exportation of coal for nearly seven months, but the prolonged unemployment has not so far affected the health of the community. The urban district council has an accident and surgical hospital with accommodation for about 30. Dr. Kent urges the need for its extension by the provision of medical, children, and maternity wards. Eighty-eight children under school age received operative treatment at the school clinics, 22 for adenoids and enlarged tonsils, and 66 for dental caries. The six notified cases of ophthalmia neonatorum resulted in one case of impaired vision. Crippled children under school age are referred for orthopædic treatment to the Prince of Wales Hospital, Cardiff, the expenses in necessitous cases being paid out of a special fund. Thirty-three cases were treated during the year. The housing situation has been somewhat eased by the erection of houses by the council, but Dr. Kent says that overcrowding will continue until houses can be erected to be let at a rental of about 8*s.* per week.

Sheerness.

Dr. W. C. D. Hills reports for the united districts of Queenborough and Sheerness. Sheerness stands on alluvial land and the whole district is flat. A final sewage pumping-station is to be installed to allow for a population of 30,000. A new housing site

has been obtained and a contract made for the erection of 80 houses. It is estimated that 250 houses are required, but the growth of the town, apart from its use as a health resort, depends largely on dockyard developments. Another scheme of 40 new houses is in hand for Queenborough where there is also a housing shortage. Both districts suffered from outbreaks of poliomyelitis. In Sheerness there were 13 cases and one death: in Queenborough there were nine cases and one death. Dr. Hills thinks it is likely that this disease is spread by means of food, more especially milk, which has been contaminated by carriers. There is no hospital on the island and non-infectious cases needing hospital treatment are removed by the St. John Ambulance Brigade to Maidstone or Rochester, 18 to 20 miles away, while infectious cases are removed to a hospital at Sittingbourne. Dr. Hills performs the duties of school medical inspector for the county council in his two districts, and accommodation is provided at Sheerness for a branch county bacteriological laboratory. The Borough of Queenborough, with a population of 3062, had a birth-rate of 20·6 and a death-rate of 10·4. Its occupations are mainly pottery, glue, chemical, and glass works. The breaking up of war vessels has now ceased and a decline in the population is probable.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED OCT. 8TH, 1927.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 149 (last week, 122); scarlet fever, 2262; diphtheria, 1158; enteric fever, 100; pneumonia, 736; puerperal fever, 35; puerperal pyrexia, 88; cerebro-spinal fever, 4; acute poliomyelitis, 45; acute polio-encephalitis, 2; encephalitis lethargica, 20; continued fever, 2; dysentery, 7; ophthalmia neonatorum, 103. No case of cholera, plague, or typhus fever was notified during the week.

Of the cases of acute poliomyelitis and acute polio-encephalitis taken together 11 were notified from the East Riding of Yorkshire (9 of these from Hull), and 8 from the West Riding (5 of these from Swinton). The dysentery notifications have returned to their normal level.

As the result of the further investigation of three cases reported in the newspapers as "mysterious disease in Warwickshire," in Warneford General Hospital, Leamington Spa, it has been established that these three patients are suffering from typhoid fever. It is anticipated that the other cases in the Southam Rural District will prove to be of the same character. The source of the infection has, as yet, to be ascertained.

Deaths.—In the aggregate of great towns, including London, there was no death from small-pox, 3 (1) from enteric fever, 14 (1) from measles, 8 (2) from scarlet fever, 19 (1) from whooping-cough, 34 (6) from diphtheria, 85 (14) from diarrhœa and enteritis under two years, and 28 (6) from influenza. The figures in parentheses are those for London itself. The number of stillbirths registered during the week was 235 in the great towns, including 45 in London.

New Inventions.

AN INFANT'S FEEDING SPOON.

THE need for a better form of spoon for the feeding of small infants has been long felt and I have, therefore, designed a spoon which seems to fulfil all requirements, in that there is no chance of spilling the

contents round the child's mouth during feeding. It is also particularly useful in cases of prematurity or hare-lip. The figure explains itself.

The spoon is made by Messrs. Mayer and Phelps.

E. A. BARTON, L R.C.P. Lond., M.R.C.S.

Reviews and Notices of Books.

MALARIAL PSYCHOSES AND NEUROSES:

Their Medical, Sociological, and Legal Aspects. By WILLIAM K. ANDERSON, M.D., F.R.F.P.S. Glasg., Visiting Physician, Eastern District Hospital, Glasgow; Teacher of Clinical Medicine, Glasgow University. London: Humphrey Milford, Oxford University Press. 1927. Pp. 395. 42*s.*

IN this book Dr. Anderson dwells at some length upon the effects of malaria in the remote past, and in a historical survey traces malaria from Egypt to Greece, and then to Rome. Frequent references to classical writers illustrate his main point—namely, that malaria has a degrading effect upon the character both of the individual and of the race. He regards the fall of these ancient empires as being partly brought about by the malarial mosquito, the conditions of civilisation of those times being eminently suitable to the rapid growth of the anopheles. In dealing with the pathology of the disease he emphasises its protean nature and discusses it broadly under three headings: (1) conditions affecting the blood-vessels (sporulation, &c.); (2) toxic conditions; (3) sympathetic and parasympathetic interaction. The divisions are well described, and the sympathetic parasympathetic interaction theory is worthy of note; it postulates that the prodromal stage of the rigor is one of vagotonia passing into sympatheticotonia during the first part of the paroxysm (the cold phase), and later into vagotonia during the sweating phase of the paroxysm. A large number of physical conditions are described under the various headings, and are usefully illustrated by case-histories and post-mortem notes.

In the section on malarial psychoses nearly all psychotic conditions are included. While in one place they are spoken of as malarial in origin, on another page the author states that "all malarial psychoses are initially confusional states, and all other mental states are further developments at a later stage of certain features on the basis of confusion." Later he suggests that malaria may act by revealing a latent constitutional weakness, such as manic-depressive insanity of dementia præcox. He argues (p. 101) that since malaria is a potent tissue poison capable of damaging any and every tissue to any degree of extent, the clinical features of any case will vary according to the degree of the damage done. This will be readily accepted, but hardly leads us to postulate a definite malarial psychosis or psychoses as Dr. Anderson does. The theory that the psychotic or psychoneurotic condition which may be ushered in as a result of malarial infection is dependent upon the individual make-up of the patient, in accordance with Bleuler's theory of the reaction type, seems more probable.

The title of this book gives no idea of its scope, and implies a limitation which does not really exist. Malaria is dealt with from every possible aspect, and, indeed, the book will, we think, be of more value to all who come directly in contact with the ravages of the parasite than to the alienist or neurologist in this country.

ANOPHELINE LARVÆ.

An Illustrated Key to the Identification of the Anopheline Larvæ of India, Ceylon and Malaya, West of Wallace's Line. With Practical Notes on Their Collection. By C. STRICKLAND, M.A., B.C., Professor of Medical Entomology in the School of Tropical Medicine, Calcutta; and K. L. CHOUDHURY, M.B., D.P.H., Chief Assistant in Malaria Surveys of Assam and Bengal. Calcutta: Thacker, Spink and Co. 1927. Pp. 67. Rs.4.8.

THIS work is a sequel to the "Short Key to the Adult Anophelines," published by the senior author in 1925; its object is to help those who are engaged in antimalaria measures in the Indo-Malayan region.

Too often malaria surveys are conducted by men who make use of the data obtained by hatching out adults from anopheline larvæ which they have collected in the field, not realising the amount of labour lost in this procedure. Much time will be saved by making the best use of the material collected, and a simple method of identification of larval characteristics should be available to all observers. This book supplies illustrative diagrammatic figures of the various larvæ, and instructions as to their collection. Appendices are added on catching adult anophelines, equipment, organisation of staff, methods of packing and dispatching specimens, and, together with a short bibliography, complete a book which admirably fulfils the object for which it was designed. The work is inscribed to Sir Ronald Ross, who contributes a foreword. It is printed on specially durable paper in large, clear type.

TOXICOLOGY.

Diagnosi e Terapia clinica degli Avvelenamenti. Guida per Medici e Studenti. By Dr. G. CORONEDI, Professor of Pharmacology in the University of Florence. Florence: G. Barbera. Pp. 310. L.30.

THIS small text-book contains much valuable information, well arranged and excellently printed. The first part treats of poisoning in general, its symptomatology, course, result, and pathological anatomy. A novel arrangement takes the reader through the effects of poisons on the various systems of the body. Some good coloured plates show the different pictures produced on slides by the addition of a drop of the suitable reagent to the gastric contents in poisoning by lead, silver, arsenic, antimony, mercury, and copper. Reactions for alkaloids and glucosides are dealt with at length. Several blood tests for use in carbonic oxide poisoning are described with coloured illustrations; the reactions of Zaleschy, Salkowski, Katayama, and Coronedi are not commonly performed in this country. In the chapter on diagnosis the differentiation between poisoning by various narcotics is set out from the pharmacological as well as from the clinical standpoint. Many pages are devoted to treatment and the mechanism of the various antidotes is fully discussed. The second part of the book deals alphabetically with every substance which is known or considered to be a poison, including alcoholism, morphinism, nicotism, snake-bite, and botulism. Even such less well-known poisons as picrotoxin, abrus precatorius, vanilla, and lupin seeds find a place in this book, and are described so minutely that a table showing the differential diagnosis between poisoning by lupin, belladonna, cicuta, and aconite occupies a prominent place. In the short bibliography with which the work ends the only references to English authors are to the work of Lauder Brunton, whose book on pharmacology and therapeutics was translated into Italian by Tamburini, and published in Milan in 1901, and to a communication by Hegar and Zunz, made at the International Congress of Medicine held in London in 1913; but in spite of the omissions Prof. Coronedi's book is an excellent work of reference.

MANUAL OF PROCTOLOGY.

Second edition. By T. CHITTENDEN HILL, M.D., F.A.C.S., Instructor in Proctology, Harvard Graduate School of Medicine. Philadelphia and New York: Lea and Febiger. Pp. 294. $3.50.

IN a small book of 294 pages Dr. Chittenden Hill has succeeded in giving a clear and practical account of diseases of the rectum. Certain chapters deserve special commendation, particularly those on ulceration of the rectum and colon, the handling of which difficult subject will be found most helpful. We are glad to see that in the chapter on rectal abscesses the author carries on the campaign against the late and inadequate incision which is too frequently the cause of fistula in ano. The chapters on fistula, hæmorrhoids, prolapse, and pruritus are all very good. In the treatment of pruritus ani, under-cutting operations, such as Ball's operation and its modifications, are not even mentioned; this omission seems to be a good way of emphasising the fact that careful search for the cause of the pruritus and its adequate local treatment are successful in the great majority of cases. A few small points call for criticism; we do not agree that complete division of the external sphincter muscle is needed in the incision of all anal fissures, nor do we approve of the advice to stretch the sphincters as a preliminary to all operations for internal hæmorrhoids. The author advises immediate operation in cases of thrombosed and sloughing internal piles, however septic they may be. We are opposed to this line of treatment; operation in such cases is almost certain to be followed by a tiresome ulceration. Treatment on expectant lines, by baths and antiseptic compresses, leads to spontaneous cure in the large majority of cases, and if operation is needed later it can be done when the sepsis has cleared up. In the section on cancer of the rectum the author states his preference for a combined operation. The last chapter, on radical operation in cancer of the rectum, is written by Dr. Robert C. Coffey, who describes his two-stage abdomino-perineal excision, with his various methods of draining the devascularised bowel pending the second operation. As yet we believe this method has not been extensively tried in this country, and though there are obvious disadvantages in the operation, it appears to be a reasonable method of dealing with a high growth in a patient whose general condition forbids a one-stage abdomino-perineal excision. The text is clear and the illustrations are remarkably good.

FUNDAMENTALS OF DERMATOLOGY.

By ALFRED SCHALEK, Professor of Dermatology and Syphilology, University of Nebraska. Philadelphia and New York: Lea and Febiger. Pp. 239. With 54 illustrations. $3.

THE presentation of knowledge in a condensed form is a thankless task. Although it may well be of some temporary value to the profession, it adds nothing to science, and mostly but little to the author's reputation, but those practitioners who have no leisure for serious study often welcome a brief outline and find it useful. There are some original features in this little book. The various skin diseases are arranged in alphabetical order, and dealt with under the sub-headings of classification, definition, symptoms, ætiology and pathology, and treatment. Some wise observations and warnings are grouped together modestly as "dermatological aphorisms," separate paragraphs on the anatomy and physiology of the skin in general diagnosis, and some notes on general therapy are included. The compilation follows the lines of the standard text-books, and has been well done. The illustrations are not clearly reproduced, and will not help much in the difficult problem of diagnosis.

THE TONGUE AND ITS DISEASES.

By DUNCAN C. L. FITZWILLIAMS, F.R.C.S., &c., Surgeon to St. Mary's Hospital. London: Humphrey Milford, Oxford University Press. 1927. Pp. 505. 36*s*.

IN this monograph Mr. Duncan Fitzwilliams has given a comprehensive account of the diseases of the tongue as viewed from the standpoint of modern surgery. In compiling it he has drawn upon the accumulated records of the past, and has supplemented these by the experience gained by himself and his colleagues at St. Mary's Hospital. The references given at the end of each chapter are evidence of the author's industry in the ransacking of "authorities"; the definite views which he expresses upon questions such as the treatment of carcinoma of the tongue show that he has thought and practised to some purpose. The result might have been a text-book

of outstanding value, but is, in fact, disappointing. Not that anything of importance has been omitted. The author's thoroughness has indeed led him into giving a detailed account of the surgery of salivary calculi, a subject which is really outside the scope of a treatise on the tongue. The book suffers throughout, however, from a diffuseness and lack of discrimination which tend to blur the outlines of the picture. Its pages are enlivened by many anecdotes; no one could fail to be amused by the story of the policeman's wife who avulsed her own tongue; but the reader is wearied by a multiplication of case-histories with unnecessary details, which might with advantage have been condensed and pruned, and a volume of over 500 pages reduced to one of 300 pages, without loss to the reader. The author's style is conversational and often ungrammatical, faults which also tend to obscure the value of the book. The same lack of discrimination somewhat spoils the impression made by the very numerous illustrations; many are of excellent quality, but others are so imperfectly drawn or reproduced that they had better have been omitted. The book, in fact, though containing much valuable material, lacks the distinction of many of the other volumes issued in the same series of publications.

INTESTINAL TUBERCULOSIS.

By L. BROWN, M.D., and H. L. SAMPSON, Trudeau Sanatorium, New York. London: Baillière, Tindall and Cox. Pp. 304. 18*s*.

IN this book the reader will find a very complete account of intestinal tuberculosis. The authors set out fully their reasons for considering this to be the most frequent complication of pulmonary tuberculosis; since from 50–80 per cent. of all autopsies on patients dying of phthisis disclose intestinal tuberculosis its high incidence is apparent. Little importance, in the opinion of the authors, can be attached to the discovery of tubercle bacilli in stools, since they occur in about 90 per cent. of all patients who have tubercle bacilli in the sputum. Digestive disturbances, on the other hand, are significant; marked constipation, increase of indigestion, and continued pyrexia with simultaneous diminution in the pulmonary signs should, the authors expressly say, always arouse suspicion of intestinal complications, whilst hypermotility of the alimentary canal, with nearly complete emptying of the colon in 24 hours, or constant segmentation with or without dilatation of some coils of the normal intestine, are amongst the most important X ray findings in cases of intestinal ulceration. As regards treatment, the authors consider that heliotherapy and exposure to ultra-violet rays are often extremely useful. The book will be read with interest by those engaged in the treatment of tuberculosis.

TOWARDS HEALTH.

By J. ARTHUR THOMSON, M.A., LL.D., Regius Professor of Natural History in the University of Aberdeen. London: Methuen and Co., Ltd. 1927. Pp. 242. 7*s*. 6*d*.

Prof. Arthur Thomson's writings have been always clearly written and sanely conceived, and his latest book will not disappoint his readers. He approaches health from the standpoint of the pure biologist, and is thus able to stimulate enthusiasm about health without laying too much stress on the way to avoid disease. He bases his biological outlook on the trilogy: organism, function, environment. The first two chapters are concerned with the analysis of life by this "biological prism." In chapter three he deals with heredity, stressing particularly the importance of nurture as opposed to nature, and he holds the balance very ably between the extremes of the inheritance and the environmental schools. The next sections in which sex and birth control are dealt with on biological lines are excellent, and offer a pleasing contrast to many of the popular writings on these matters. After a chapter on the healthy mind, packed full of common sense and sound psychology, the practical applications of biology are discussed in a chapter headed "What can be done?" Prof. Thomson's suggestions are by no means revolutionary, and have a scientific basis. Because it is so good certain small errors should be corrected in the next edition. Lister introduced antiseptic, not aseptic, methods of modern surgery (p. 23), vitamin C is not concerned with rickets, as is suggested (p. 57), and, since the Huntingdon type is so rare, it is misleading to say that some forms of St. Vitus's dance are inherited (p. 72).

We would commend a study of this book to the great statesman mentioned on p. 200, who summoned an eminent man of science and asked what should be done to secure an A1 physically fit society, for Prof. Thomson's book is full of constructive suggestions.

CONTRACEPTION.

Its Theory, History, and Practice. Second edition. By MARIE CARMICHAEL STOPES, D.Sc., Ph.D. London: John Bale, Sons and Danielsson, Ltd. 1927. Pp. 480. 15*s*.

THE second edition of this book, the title page informs us, appears on the completion of the sale of 40,000 copies of the first edition, published in June, 1923. The new edition contains some 60 pages of fresh matter. More, it represents the fruit of much practical experience. Since its foundation in March, 1921, there have passed through Mrs. Stopes's clinic in Holloway over 8000 women—a number surely large enough to satisfy the statistical demands of the most exacting inquiries.

In this book are described certain modifications of contraceptive technique which have been found helpful. Chinosol (described as a disinfectant; its chemical composition is not given) is now used in place of quinine, in a cocoa-butter suppository, as a routine at the author's clinic, in addition to the all-rubber occlusion cervical cap. Mrs. Stopes deduces from certain observations she has made that a process of "interlocking" takes place during coitus with women with a patent os. The question is of importance since, if it takes place, it necessarily follows that a reliable contraceptive technique cannot be evolved from a chemically spermicidal principle alone.

Like the first, this edition contains a very well documented history of the theory and practice of contraception, to which the author has clearly devoted much time. Much that is contained in these chapters is original. There is a chapter on contraception and the law, and another upon instruction in contraception in medical schools which might be read with profit by many medical men. This edition amplifies and consolidates the status achieved by the first.

JOURNALS.

BRITISH JOURNAL OF CHILDREN'S DISEASES, Vol. XXIV. July–September.—Dr. Matthew Young and Mr. W. T. Russell contribute a paper on Sexual Differentiation in Susceptibility to and Mortality from Whooping-cough in Children under 5 Years, their conclusions being as follows: The mortality from whooping-cough computed from the deaths registered as due to this cause is generally sensibly higher in females than in males under 5 years. This sexual differentiation in mortality from whooping-cough and its complications becomes more intensive as age at death increases from 1 to 5 years. The statistics of cases notified in Glasgow and Aberdeen confirm the impression based on hospital admissions that female children are more susceptible to the disease than male children. The only feasible explanation of this sexual differentiation in mortality seems to be that infection with the whooping-cough germ, though seldom fatal in itself, has apparently the ability to modify in an unequal degree the powers of resistance of male and female children, rendering females more vulnerable than males to intercurrent respiratory infections and

their sequelæ. An analogy can be found in certain other diseases, such as chorea and goitre, which occur at a later period of life, and appear to affect the female sex more frequently and with a greater fatality than the male.—In the first part of a paper on the Insulin Treatment of Diabetes Mellitus in Children Dr. K. U. Toverud, of Oslo, discusses the frequency of diabetes mellitus in children in Norway and records his observations on four years' insulin treatment in children aged from 1½ to 14 years, showing the effect of the treatment on the physical and mental development of the child, with remarks on the technique of insulin administration and the reaction to the drug.—In Part II. of their paper on Hemiplegia Associated with Extensive Nervous and Mental Defect, Dr. T. Brushfield and Dr. W. Wyatt report two more examples of this syndrome and allude to three similar cases, apparently the only ones on record, published by E. A. Cockayne, F. Parkes Weber, and D. M. Greig respectively.—A paper follows by the late Dr. Edith Bronson on Functional Cardiac Disorders: Symptoms, Signs, and Treatment.—In a paper on Some Practical Points in the Treatment of Ringworm with Thallium based on his observations at the Skin Department of the Royal Alexandra Hospital for Sick Children, Brighton, Dr. J. H. Twiston Davies describes the technique of this method together with some practical points relating to the pharmacology of thallium.—The abstracts from current literature are devoted to genito-urinary diseases.

BRITISH MEDICAL ASSOCIATION.

ANNUAL DINNER.

THE sixth annual Council dinner of the Association was held at the Hotel Victoria, on Wednesday, Oct. 12th, under the chairmanship of Dr. H. B. BRACKENBURY, when a large company was present.

When the loyal toast had been honoured, the Chairman proposed the health of the Retiring Officers. Mr. R. G. HOGARTH (immediate past president) paid tribute in reply to the loyalty and wisdom with which he had been supported in his year of office by his associates. Sir ROBERT BOLAM, the retiring chairman of the Council, also speaking in reply, welcomed the two Ministers of the Crown who were present as evidence of official confidence in the Association.

The Toast of the Common Health.

Mr. H. S. SOUTTAR, in proposing the Common Health, remarked on the wide interest now taken by the public in the health of the nation, and said that the medical profession had played its part in the improvement of health well but in an incoördinate way which made us the despair of other nations. The hospitals, originally a refuge for the sick poor, had become great machine shops for the cure of those who were ill, with a wonderful organisation for following up discharged patients. In themselves they were coördinated, but they were isolated, and had as little connexion with the great body of general practitioners and with the municipal and State hospitals as if the latter did not exist. Surely much could be done by coördinating all three services. That, it seemed, was where a Ministry of Health came in. He envisaged the hospital in which he worked as the centre of a great medical service, embracing all practitioners. This would not be an infraction of the voluntary principle. There was, moreover, an important distinction between a State medical service and medicine in the service of the State; the former might be somewhat un-English, the latter was thoroughly British. Service of the State was much greater than service of the profession, and we need not shrink from it.

The Minister of Health's Reply.

Mr. NEVILLE CHAMBERLAIN, in reply, outlined the parts which his department and the profession played respectively in working for "the common health." Doctors repaired the damage done by heredity, environment, and the ignorance and folly of their patients; the Ministry's part was to surround the individual with such signposts, safeguards, and wire entanglements as would leave the profession as little to do as possible. There could be no better evidence than the fall in the adult and infant mortality-rates to prove that both sides were making a good job of their work. Some credit could be claimed for the activities of the Ministry, especially in its attack on tuberculosis and its maternity and child welfare work. One of the most potent factors had been the education of the men and women of the country in the means of keeping healthy, an education fostered by general practitioners, medical officers of health, school medical officers, and—with perhaps at times some bewilderment to the public—by the press. He hoped that the new powers given to the Ministry would result in an extension of this work, to the confusion of mischievous fanatics such as those who were responsible for the rapid spread of small-pox. Education, moreover, was needed by practitioners. It was no wonder that, working for years far from the centres of knowledge, they were apt to miss the early signs of diseases such as tuberculosis, the treatment of which had cost the nation last year £2,500,000. He was deeply interested in the post-graduate medical school which it was proposed to establish at the West London Hospital. General practitioners, besides learning there, might have something to teach those working on education or research. Although the housing problem was by no means solved, new accommodation had been provided for 1,000,000 persons in the last 12 months, thus opening up a path to an attack on the slum problem. This was not only a problem of clearance; in 1925 500 times as many houses had been repaired and reconditioned by local authorities as had been demolished under clearance procedure. Other activities of the Ministry, continued Mr. Chamberlain, had been the provision of cleaner milk, purer food, and a less smoky atmosphere, and he hoped to see added to the Statute Book before Christmas the Nursing Homes Registration and Mental Deficiency Bills. Further in the future lay legislation on the slum problem and on lunacy, with especial reference to the protection of the certifying doctor. He would like to see a system of specialist services in connexion with National Health Insurance and, above all, the reform of the Poor-law. Unless better coöperation could be secured he feared for the voluntary system, the loss of which would be a disaster, and one of the most effective steps in coöperation would be the conversion of Poor-law infirmaries into municipal hospitals. Without some measure of this sort he saw no hope of realising the ideal, namely, hospital treatment for every citizen in the country. He spoke warmly of the good relationship that existed between the Association and the Ministry and appealed for their confidence and support.

The Guests.

Dr. R. W. LESLIE, in proposing the Guests, alluded to the future of the medical profession in India and congratulated the Indian Medical Service on having so capable a hand as that of Lord Birkenhead on the reins. He deplored the condition of medical charities.

Lord BIRKENHEAD spoke of the advantages of a medical career in India for young and adventurous scientific men.

Dr. RAYMOND CRAWFURD, who also replied, emphasised the lamentable state of medical charities, and reminded the company that one guinea per annum from every medical practitioner would solve the whole problem.

The health of the Chairman was informally proposed by Sir EWAN MACLEAN (the president-elect of the Association), and after Dr. BRACKENBURY had replied the proceedings closed with the singing of Auld Lang Syne.

THE LANCET.

LONDON: SATURDAY, OCTOBER 22, 1927.

ENCEPHALITIS LETHARGICA TO-DAY.

IT is now about ten years since encephalitis lethargica made its appearance in England. The early cases were chiefly characterised by prolonged sleep, and the physicians who watched these first patients spending days or weeks in peaceful slumber, or (as often happened) passing through slumber to an easy death, could little realise the unspeakable cruelty of the curse that had come upon us. Now, after ten years, we are in some position to take its measure. Every succeeding year has seen its epidemic; the acute phase of the disease has quickly grown milder, so that severe cases are seldom met with, and often the invasion is so mild that the patient is unaware of any illness. But now we know that the frightfulness of the scourge lies in its after-effects, that few patients in whom the acute infection has been recognised entirely escape undamaged, and that even those in whom this phase has been unrecognisable, or in whom it may not have existed at all, may suffer severely as a result of the infection. Symptoms may persist without intermission from the acute illness or may develop weeks or months or years after the patient has seemed to make a good recovery; though the interval is generally less than 12 months, a Parkinsonian syndrome has been known to develop as long as five years after the original attack.

It is only natural, since the brain controls many functions, that the consequences of its derangement should be very various, and in fact the different clinical pictures presented after encephalitis are almost innumerable. The great majority of cases, however, fall into one of three groups in which the principal symptoms are respectively motor, mental, or respiratory. The first of these groups is undoubtedly the largest; in the second, with mental symptoms, most of the patients are children and adolescents; the third is much smaller than the other two, but respiratory tics following encephalitis are becoming widely recognised and are now mentioned in almost every report. Common to nearly all the cases—into whatever group the other symptoms may fall—is a disturbance of the rhythm of sleep. At night these patients, especially the children, become more awake and lively and mischievous, sometimes excited, sometimes frightened. This is one of the few symptoms which has a definite tendency to recover and, if diurnal sleep is prevented it seldom continues more than 12 months. The motor manifestations constitute the now familiar Parkinsonian syndrome, and some signs of this syndrome, however slight, are presented in nearly every case. They resemble most nearly the picture of paralysis agitans, except that there is little or no tremor. The general feature from which the more obvious symptoms arise is a rigidity or hypertonus of all the muscles, and at the same time there is loss of automatic or synergic movements. The result is general stiffness of the body, slowness of movements, and a mask-like, staring expression. In many patients nothing more than a fixity of the facial expression is to be observed; in others, at the opposite extreme, the difficulty of movement may become so great that they are unable to feed or dress themselves, and can hardly chew their food. Owing to the stiffness of the muscles of the face and jaw the mouth is habitually held open, and excessive salivation causes a dribbling which is sometimes felt as one of the greatest burdens. As in the true Parkinson's disease there may be a loss of equilibrium, a tendency to run forwards or backwards, or, when sitting, to let the body sink slowly forwards or sideways till the head is on the level of the seat of the chair. As a rule, there is no injury of the pyramidal system, but hemiplegia or even bilateral pyramidal disease may be present in association with Parkinsonian symptoms.

The mental changes, as has been said, occur chiefly in children and adolescents, though they are by no means unknown in adults. The intelligence is seldom affected; nearly always the alterations are in the sphere of moral control and sometimes emotional disturbances may be added. The children, clean and docile before the attack, begin to use bad language, lie, thieve, masturbate, and be cruel to other children; at the same time they may be irritable and have outbursts of weeping or demonstrative affection. Many of them find their way to the police-court, and thence to the indicated asylum. Lastly, the respiratory tics are among the most curious of the many symptoms that encephalitis has made known to us. Probably the commonest consists in periods of tachypnœa. In a recent report to the Metropolitan Asylums Board Dr. G. A. BORTHWICK, of the Northern Infectious Diseases Hospital, mentions that visitors to the post-encephalitic unit are at once struck by the sound of heavy panting as if many of the patients had just been running a race. The attack may last from two or three minutes to many hours, and cases have been recorded in which the hyperpnœa induced tetany. Hyperpnœa may be followed by a short spell of apnœa, as in Cheyne-Stokes breathing. There may also be sighing, yawning, coughing, and other noisy expiration. These may be accompanied by more or less rhythmic movements of the arms or trunk and sometimes the patient is in great distress.

Treatment of the after-effects of encephalitis has not been at all successful as regards cure, though something may be done to ameliorate the sufferers' condition. Hyoscine and belladonna, combined with massage, help to reduce the rigidity and salivation of the Parkinsonian state. Acting on the view, now gaining ground, that there is often residual infection of the brain after the acute attack, or that the infection may be chronic from the beginning, several workers have tried the effect of malarial treatment. The hope is that malaria or its effects may overcome the infection and cause the symptoms to pass away; the extent to which this hope is realised may perhaps be estimated from the results contributed to our present issue by Dr. ROY CRAIG and by Drs. P. K. MCCOWAN and L. C. COOK. Failing more efficient means of treatment we can only look to epidemiologists to find more efficient means of prevention.

THE FIRST-BORN.

THE peculiar position which the eldest son occupies in the English family by law and convention is generally attributed to the greater probability that his younger brothers have not the same authentic origin. Its advantage to the community may be doubted in view of Prof. KARL PEARSON'S discovery that first-born children enter on their fight with the world under some handicap in body and mind; but on the other hand this discovery does not neces-

sarily imply a willingness on the part of society to be led by weaklings, for it is arguable that the possession of family state or title is an obstacle, rather than otherwise, to holding positions of great responsibility. It is worth considering, perhaps, whether the queer local variant of the "Borough English" custom which put the youngest in the seat of the eldest did not have its beginning in some practical unsentimental idea that the boy to carry on the family should be as little as possible defective in any way. Whatever the truth of these theories may be the facts themselves are extraordinarily interesting, and Prof. G. F. STILL'S Ingleby lectures, the first of which we published last week and the second of which appears this week, will, we are sure, stimulate many readers to look further into the whole question.

Prof. STILL concludes that there is definite evidence that congenital hypertrophy of the pylorus is much commoner in first-born than in later children, and that congenital heart disease, other congenital abnormalities, mental deficiency, and probably epilepsy have the same relation to order-in-family. The validity of these conclusions depends, of course, on the method by which they have been reached, and we would direct particular attention to the ingenious way in which Prof. STILL has met the very considerable difficulties of the inquiry. He rightly insists that first-in-family must mean the first pregnancy, not the first live child. There are no official mass statistics of miscarriages and until recently none of stillbirths; reliance can, therefore, be placed only on individual data which have been personally collected from parents, and he does not minimise the facts that many early pregnancies are not identified and recorded as such, and that women are apt to forget conceptions that did not result in some tangible product. The data are thus open to some criticism, though it is difficult to see how they could be bettered. Seeking to establish the proportion of those who are first-born by this criterion in an average normal population, he brings out plainly what is so often overlooked in medical statistics—that the clientele of hospital and private practice are a class selected by a variety of considerations and are by no means necessarily representative, quite apart from their illness of the moment, of the population as a whole. Nearly one-half of 1000 consecutive children seen by him in private practice were first-born; such mass statistics as are available show that only about one-fifth of live children fall in this group. It is fairly obvious that the difference might be due to maternal anxiety and inexperience, quite apart from any differential incidence of disease. A fair sample of the general population from which his patients are derived seems to be unobtainable except with the aid of a battalion of home visitors who would accumulate the obstetric histories of hundreds of women who at the moment were not interested in sick children; their curiosity might be rewarded or it might not. The results at any rate are not available at present. For them Prof. STILL substitutes the distribution of place-in-family in 900 cases of pneumonia, judging on a priori grounds that the number of instances of such a disease for which medical aid is sought will be determined by necessity rather than choice, and that it is a disease which is very unlikely to have any relation to the order of pregnancies. From this he derives a standard curve which shows about 20 per cent. of children as first-borns. But of 400 cases of congenital hypertrophy of the pylorus, some 48 per cent. are first-born, while 500 instances of tuberculosis and 1000 of digestive troubles are distributed among the place-in-family groups in almost exact correspondence with the standard curve. It seems fairly clear that eldest children are particularly prone to pyloric hypertrophy; if there is some fallacy in the statistics and they are not, it would appear to follow that first-borns are *less* liable to pneumonia, tuberculosis, and alimentary disorders; in either case place-in-family is a factor in determining the incidence of disease, and if that fact has been definitely established for any one disorder there is every encouragement for others to pursue the topic as he has done.

Experience counts for much. SAMUEL BUTLER thought that accumulated experience was the basis and method of evolution, and even those who are not prepared to join him in such heresies will admit its efficacy in the life of an individual. Repeated trials and practice will improve the capacity of the body to do anything—from playing golf and bridge to the production of antibodies and the regeneration of red corpuscles. The same must surely be true of conception and pregnancy. A first child is liable to have rather a rough passage into the world because of his mother's inexperience, and for the same reason often has much too smooth a voyage afterwards. Practice will improve his mother's dexterity in parturition and discipline, and it requires no great imagination to believe that the skill of her tissues in the delicate intricacies of fertilisation and early pregnancy will also increase with trials.

THE HOSPITAL POSITION IN SCOTLAND.

THE hospital position in Scotland is entering an acute phase. Last year Lord MACKENZIE'S Committee on Hospital Services reported that there was a shortage of some 3000 hospital beds in the country, and the accompanying recommendations of the Committee formed an attempt to formulate a policy for Scotland which should preserve and develop the voluntary hospitals, while securing, by intimate and friendly coöperation, a continuously adequate hospital service. This would imply joint effort on the part of the voluntary hospitals and the local authorities, and the removal of the poor-law stigma from all institutions; the transfer of powers to the local authorities being designed to introduce that policy of "all-round coöperation" which now represents the predominant view in Scotland. At the recent meeting of the Scottish Regional Committee of the British Hospitals Association in Glasgow, the speakers were, practically without exception, in favour of this policy; Colonel D. J. MACKINTOSH, superintendent of the Glasgow Western Infirmary, in an admirable discourse, made it plain that the future of the voluntary hospitals depended on their coöperation with one another and with the statutory bodies. In Glasgow already there is a certain amount of coöperation of the kind wanted, but it was agreed by the meeting to send a deputation to the Secretary of State for Scotland, with the view of getting a definite lead on the Government's hospital policy. But quite apart from questions of possible State subsidy to make good the shortage of beds which will thus be raised, the representatives both of the local authorities and of the voluntary hospitals hold strongly that a scheme of readjustment is necessary.

Meanwhile, at Aberdeen, Sir JOHN GILMOUR, Secretary of State for Scotland, has presided at the formal opening of the Woodend Hospital, when the parish council handed over the keys to the town council. This marks an important stage in the development of a great hospital scheme for Aberdeen. As the Secretary of State explained, there are four bodies materially involved—the University through its medical school, the Royal Infirmary as the great medical and surgical hospital, the municipality as in charge of the City Hospital for Infectious Diseases,

and the parish council as in charge of the poor-law hospitals; and the problem was to readjust the management of the institutions so as to honour in full all the interests involved. The poor-law hospital was not sufficiently equipped to justify the Scottish General Nursing Council in recognising it as a training school for nurses. This parish hospital was erected less than 30 years ago, and a "special" hospital has been erected more recently. But this "special" hospital of 180 beds stood vacant, giving an opportunity for negotiations, while the City Hospital for Infectious Diseases badly needed extension both for cases and for staff, while a vacant hospital stood ready for their use. A proposal was made that the municipality should not merely use the special hospital for municipal cases, but should also take over the medical work for the parish council, and an agreement was arrived at that the municipality should be responsible for the medical and surgical treatment on modern lines of all poor-law cases requiring treatment, including cases from the county parishes of Aberdeen as well as from the city. The city also adapted the special hospital to its own requirements.

Further proposals were made for the extension of the City Hospital itself, an extension long overdue; but for this and the other developments the sanction of the Scottish Board of Health was required. Before giving sanction, however, the Secretary of State, as President of the Board, would have to be satisfied that other interests concerned—namely, those of the University medical school and the Royal Infirmary—were not placed under any disadvantage. Therefore, the condition had been made that the clinical professors of the University should have full facilities for teaching both in the City Hospital and in the new Woodend Hospital. The full significance of the opening of the Woodend Hospital by the Secretary of State thus appears. Under his sanction these two institutions, invloving ultimately perhaps 700 beds or more, should be available in the fullest sense for the work of the medical school and the care of the appropriate cases. And this does not complete the story of hospital development in Aberdeen. For a new Sick Children's Hospital on the Forresterhill site is rising, and, with the financial assistance of the city, a new Maternity Hospital is to be provided in the same campus, where there is already a Maternity Home. Agreements, also, have been concluded whereby the University and the Royal Infirmary acquire from the municipality a sufficient portion of the same area for a new Royal Infirmary. Research and teaching departments of the University will be placed here, and a sanatorium for tuberculosis is projected. Thus, on the one campus, the University student will have easy access to a series of primary institutions, and by the arrangements now completed the new Woodend Hospital and the City Hospital, though a considerable distance from Forresterhill, will become integral elements in the total scheme. And the same general group of consultant and visiting physicians and surgeons will be in a position to adjust their particular services to the conditions of the patients.

The problems at Aberdeen have arisen out of the city's own peculiar difficulties, but the course that is being taken is of wide and general significance. Here, at a single stroke, the municipality assumes and arranges for a complete hospital service for all sick persons entitled to treatment at the hands of the statutory bodies, and, at the same time, the voluntary hospitals are not merely preserved in their autonomy but are materially assisted in their working resources. The main obstacle to the realisation of the great scheme as a whole has been the cost of a new Royal Infirmary, and this is in fair way to be removed. The Lord Provost of Aberdeen, Mr. ANDREW LEWIS, has asked the public for £400,000 to build and partially endow a new Infirmary, and has already obtained over £253,000 towards that sum. Feeling confident of obtaining the amount asked for, he has set the final negotiations on foot for the acquisition of a sufficient site, and the plans for the new Royal Infirmary are in preparation. Lord Provost LEWIS has thus brought about the present position whereby this satisfactory combination of poor-law and municipal hospitals has been effected, and has also succeeded in pushing forward on a large scale the design of the Voluntary Hospitals Commission. His achievement proves that there is in the end no real antagonism between the voluntary system and the official system. It proves further that, by judicious and friendly coöperation, the common hospital services will now become more adequate, and the incalculable value of the voluntary system will be more fully realised. No doubt the City of Aberdeen is in a very fortunate position; because, from time immemorial, the City Authorities and the University have worked together in the most intimate way. When, over 30 years ago, the modern extensions of Marischal College were planned, the pessimists declared that the scheme was Utopian. Yet when KING EDWARD VII came to open the new buildings, scepticism had long vanished. It will be the same when the joint hospital scheme is completed. What Aberdeen has done, other cities, in their own special way, can also do. From the friendly attitude of the British Hospitals Association, it seems probable that we shall not have to wait long for similar developments.

Annotations.

"Ne quid nimis."

THE ASSOCIATES OF HARVEY AND HUNTER.

DURING the past week two of the really great men of medicine have been officially commemorated. On Monday, at the Hunterian Society, Mr. A. E. Mortimer Woolf devoted his second presidential address to Some Personalities of the Hunterian Epoch, the bicentenary of John Hunter's birth falling during his term of office. On Tuesday, at the Royal College of Physicians of London, Sir William Hale-White delivered the Harveian oration—printed in another column of our present issue—taking as his title Gilbert, Bacon, and Harvey. Foundations for the annual commemoration of any one man, however distinguished, are hampered by the fact that there must come a time when it is difficult, if not impossible, for the orator to say anything new about the man whom it is desired to commemorate. For this reason Sir William Hale-White chose rather to look among Harvey's contemporaries in order to see who were the men around him who might especially have influenced his life and work. Harvey was, of course, Francis Bacon's own physician, and a book which became so immediately popular as did the "Advancement of Learning" must have been familiar to him. In this book Bacon pleads for the experimental method and for the appropriate reward of experimenters, whom he describes as the "spials and intelligencers of Nature," and although a strict comparison of dates may suggest that Harvey could owe nothing to the "Novum Organum," yet it is reasonable to suppose that Bacon, who made no secret about his philosophical work, talked about it with his physician as he did with his chaplain, so that his teaching can hardly have failed to touch the mind of Harvey. In London as it then was, no bigger than a large provincial town, the two must have seen much of each other; Bacon with his chronic introspective dyspepsia must have consulted his physician frequently; there may be no evidence that Bacon attended Harvey's Lumleian lectures, but Harvey's writings bear the impress of scientific deduction, the counterpart of that of the philosopher. Sir William Hale-White will, we think, persuade his readers even if, as he admits, the evidence is circumstantial rather than direct; "how little," he remarks, "we know of the daily doings of people who lived 300 years ago."

This is true of the Hunterian epoch, for apart from the results of their scientific labours it is remarkable

how little we know of the personalities of the Hunters or of their contemporaries—William Cullen, William Smellie, Joseph Black, Gilbert Blane, William Clift, and the others to whom Mr. Woolf refers in his address. He naturally gives pride of place to John Hunter's illustrious brother William, to whom John owed a debt of gratitude which most regrettably he forgot in after life. Of William Hunter we know that he was physician to Queen Charlotte, but he had another patient in a more humble walk of life, whose child is better known to many than the sovereign in question. On the evening of June 23rd, 1766, Mrs. Smith was returning in a hackney coach from the house of her brother in Seven Dials to her own house in Great Portland-street, and while still in the coach gave birth to John Thomas Smith, author and antiquary, whose "Book for a Rainy Day" and "Nollekens and His Times" could ill be spared. Mr. Woolf believes that during Hunter's time witchcraft had a great influence on medical treatment. However that may be, quackery, of course, was still rampant and even the medical profession was not exempt from belief in quack remedies. A notable example he gives is that of Joanna Stevens, who contrived, with the aid of various titled persons, and armed with testimonials from Cheselden, Cæsar Hawkins, and Samuel Sharpe, who had been Cheselden's apprentice, to get £5000 out of the Government for the recipe of her remedy for the stone. Mr. Woolf mentions another quack, Taylor the oculist, who dubbed himself Chevalier, and numbered among his patients the infant Gibbon. Johnson and Walpole both took him at his proper valuation. The latter, in a letter to Mann, dated June 9th, 1755, thus refers to him: "I need not desire you not to believe the stories of such a mountebank as Taylor. I only wonder that he should think the names of our family a recommendation at Rome; we are not conscious of any such merit; nor have any of our eyes ever wanted to be put out." Mr. Woolf discoursed pleasantly about other medical men of the time—Abernethy, Hewson, and the shameless Jesse Foot; he tells the story of Sir William Blizard attending in full court dress to receive bodies from the hangman, although we believe he is not right in locating the College of Surgeons itself in Cock-lane—the College had hired a house in that street for the purpose of official dissections, the place being convenient for Newgate. Last and by no means least of those mentioned by Mr. Woolf is William Clift, the unwearied curator of the Hunterian Museum. Clift died in 1849, but many years earlier he nearly met with the fate of Jonah. A whale had been captured off the Nore and the carcass beached on the Isle of Dogs. Clift, always on the alert for any specimens of anatomy, went down to see it. He stepped inside the mouth which was propped open and immediately slipped on the oily decomposing tongue towards the gullet. From this perilous situation he was rescued by a boat-hook. Mr. Woolf is to be thanked for his informing and amusing address.

THE PNEUMOCOCCUS IN LOBAR PNEUMONIA.

THE investigations of the Rockefeller Institute have shown that there are three dominant types of pneumococcus each possessing a specific immunity reaction. They are called Types I., II., and III., whilst all other types, including many as distinct as the first three, are grouped together and referred to collectively as Type IV. Types III. and IV. are often found in the mouths of healthy people, but the others never. An attempt has now been made by R. L. Cecil, H. S. Baldwin, and N. P. Larsen[1] to correlate the type of pneumococcus with the clinical manifestations, complications, and other features of the disease. Two thousand cases of lobar pneumonia were examined bacteriologically and clinically, and 1913 were due to the pneumococcus. In classifying these preference was always given to the pneumococcus as the causative organism if the infection was mixed. The type was usually determined by examination of the sputum or pharyngeal swabs, sometimes by blood culture, and in fatal cases by lung puncture after death. Inoculation of mice was used exclusively for further investigation of serum reactions. It was found in the series that 34 per cent. were of Type I., 19 per cent. of Type II., 13 per cent. of Type III., and 33 per cent. of Type IV. Types II. and III. were the most fatal, each with death-rates of 42 per cent.; Types I. and IV. were milder, with death-rates of 21 and 29 per cent. respectively. The authors point out, however, that these figures alone cannot be taken as an estimate of virulence, for the age-incidence of the various types is probably a factor of at least equal importance in prognosis. This is confirmed by the observation that young people are particularly prone to Type I. infection and the elderly to Type III.; yet when Type III. does occur under 30 it is not a severe infection. In 329 patients a blood culture was taken, and it was found that among 240 whose blood was sterile the death-rate was 19 per cent., whilst among 89 positives it was 83 per cent. In Types II., III., and IV. a positive culture indicated a fatal termination in 90 per cent. of cases, but in Type I. the prognosis was less grave. These figures, it is pointed out, are open to a serious criticism on the ground that in many cases only one or two cultures were taken. It is not stated at what stage in the disease or in what particular type of case blood culture was attempted. The mortality was found to increase with the number of lobes involved, but this seemed not to depend on the type of pneumococcus. The incidence of severe complications was very much higher with Type I. infection, but here again the tendency of children to be affected rather than the type itself may have been the chief factor. This analysis of a large number of cases gives a clear idea of what the physician gains by finding out the type of pneumococcus with which he is dealing. Apart from the possibility of employing serum treatment, if the organism happens to be of Type I. this knowledge does not appear to be of great use in the individual case, the features of the types being obscured by such factors as age, extent of pulmonary involvement, and coexisting disease. A positive blood culture seems to be of more value in prognosis, but a single negative result is not to be relied on, whilst repeated examinations do not seem advisable in a patient who is very ill with lobar pneumonia.

[1] Arch. of Intern. Med., September, 1927.

THE USE AND ABUSE OF ENEMAS.

Dr. L. J. Hirschman in a recent paper[1] points out that it is a pity to obscure the uses of properly administered enemas by too much enthusiasm. They may be used legitimately for cleansing purposes, for rectal feeding and the administration of drugs, for the relief of abdominal distension, and for the direct application of antiseptics and astringents to the mucous membrane in bacterial infections. They may also be employed to lower or raise the temperature of the body, whilst opaque enemas are essential in radiographic examination of the lower bowel. He considers that flushing out the colon by gallons of water has been done too much in recent years. A large quantity of water, he says, not only distends the bowel, but causes hyperæmia and removes the mucus which is the normal intestinal lubricant; regular and too frequent irrigation also irritates the mucous membrane and robs the muscle of the bowel of the solid material which is necessary to maintain its tone. Constipation, in his view, can never be cured by colon irrigation alone, and in many cases in which X ray examination shows evidence of adhesions the method should never be tried. Soap is as irritating to the mucous membrane of the bowel as to the conjunctiva, and should not be given in enemas as it produces an angry red appearance of the mucous membrane which is often mistaken for proctitis; Dr. Hirschman prefers 1 per cent. sodium bicarbonate as a routine. The type of tube used is important, and it should never have a hard rubber or glass nozzle as this is liable to cause injury. The best

[1] Jour. of Amer. Med. Assoc., Sept. 24th.

tube for insertion is a soft rubber urinary catheter (20–24 French scale) with a conical top beyond the aperture, and this can be connected to the ordinary enema top. The lubricant should be water-soluble and is best made of gum tragacanth or Iceland moss. Glycerine should never be used if there is any reason to suspect a raw surface. Olive oil makes subsequent cleaning for operation more difficult. The lateral position is the most convenient posture, he says, for administering the enema, as the parts can be seen and the weight of the abdominal viscera is away from the bowel, so that there is no obstruction to the entrance of the fluid. Opaque enemas have shown that one pint of fluid will pass to the cæcum in one minute, and it is unnecessary and generally impossible to pass a rectal tube into the sigmoid without using a sigmoidoscope. When fæces are hard or impacted one part of hydrogen peroxide to two of warm water may be used to disintegrate them, and for the expulsion of flatus a 6 per cent. solution of powdered alum is more effective than turpentine. Dr. Hirschman ends his series of comments by pointing out that there is no reason to include starch or milk in the nutrient enema, though glucose, as is now generally recognised, may usefully be given.

THE PROVISION OF DENTAL CLINICS.

THE fifteenth annual report of the British Dental Hospital shows that this beneficent institution is now responsible for equipping and maintaining four treatment centres, 12 maternity, child welfare, and tuberculosis dental clinics, and one minor ailment centre. Its object has always been to work in conjunction with borough councils, the hospital providing facilities and skilled treatment while the municipalities provide a sum towards upkeep. In many respects this is an ideal arrangement, and it is not surprising that an increasing number of councils are taking advantage of it. The scheme makes for efficiency because it does away with all possibility of unwise interference by the laity in professional matters, and ensures that the staff of dental surgeons are chosen for reasons of professional skill, being elected by members of their own profession who manage the hospital. This eliminates the chance of wire-pulling sometimes associated with appointments in the hands of local political bodies.

There is much concern in the dental profession at the present time over the demand of the approved societies that dental clinics shall be established to treat insured persons, for there is some reason to fear that these clinics, being largely controlled by the societies or their nominees, may put economy (at the expense of the dentist) before the real interest of the patients. The British Dental Hospital points out the way in which clinics could be established which would give the best possible treatment to insured patients and yet allow perfect freedom for the staff in purely professional matters. Although established to provide treatment for those unable to afford ordinary fees, it is not a purely charitable institution like the voluntary hospitals; fees are charged, though they are modest, and on the whole the institution is self-supporting. Besides offering dental treatment it has always aimed at educating the public in oral hygiene and at assisting public bodies in the provision of dental facilities, and useful work in both directions is being carried out.

It is probable that few medical men are aware of the extent of the various dental clinics in existence in this country. The school clinics controlled by the London County Council and other public bodies are familiar to all, though the immense scope of their work is imperfectly known. But in addition to these there are dental clinics for tuberculous patients and in connexion with maternity and child welfare centres, and in the aggregate the amount of treatment carried out by means of public funds is very considerable, though still pitifully inadequate to the needs of the community. It is certain that the future will see a wide extension of public dental service in many directions. In the treatment of tuberculosis, for instance, care of the teeth is often an essential, both as regards the removal of septic foci and the provision of artificial teeth for purposes of mastication. In antenatal clinics the need is equally urgent. It has been suggested that dental sepsis may be a factor in the occurrence of puerperal sepsis, whilst H. Waller has shown that maternal sepsis affects the suckling infant. The occurrence of widespread dental disease in young children makes the provision of dental clinics for the pre-school period another urgent necessity. It is refreshing to read this account of an institution which has accomplished so much useful work without any generous assistance from the public.

RESEARCH ON HEREDITY.

THE hygienic era in which privies and albuminoid ammonia dominated the field has been replaced by one where bacteriologists have had as much influence as they deserve. The next phase of preventive medicine will presumably be mainly concerned with the heritable constitution of individuals, and we shall really get to grips with the question of nature or nurture. It is a welcome sign of the times that Dr. F. A. E. Crew, director of the Animal Breeding Research Department of the University of Edinburgh, has been appointed to give the Milroy lectures next year, and the annual report of the establishment over which he presides with such productive success contains a number of items of interest to human pathologists, as well as material more immediately germane to the objects of the institution, which was founded primarily to make a genetic analysis of farm animals with a view to their improvement. The tassels on the necks of some goats, for example, which are the best available remnant of a cervical ear and have each a little dermoid cyst at their base, are a heritable character and, with qualifications, their presence is dominant to their absence. A study of the pterylosis of the "hackleless" fowls with naked necks shows that the condition is not due to individual disease, but to an inherited defect in the development of the feather follicles in certain skin areas. Male mice treated with alcohol generate proportionately many more male offspring than normal animals, an observation which we hope will not be translated into human legislation without further consideration. An achondroplasia-like disease has been identified in sheep, analogous perhaps to the "bull-dog" calves of Dexter-Kerry cattle. Without going into details of the many other investigations summarised in the report, we may congratulate the International Education Board on finding such a suitable recipient for the £30,000 which they have given to promote the work of the institution.

A DISCUSSION ON RICKETS.

THE Section of Pædiatrics of the Massachusetts Medical Society recently devoted a session to various aspects of rickets, and a number of well-known authorities expressed their views.[1] Dr. J. L. Gamble reviewed the results of experimental work performed on the blood. As the most likely explanation of the mode of ossification of normal bone, he accepts the hypothesis of J. Howland and B. Kramer that precipitation of calcium phosphate in bone is due to the concentration of carbonic acid being lower in the osteoid tissue than in the plasma. There is no reason, however, to suppose that this reduction of carbonic acid concentration fails to occur in rickets and the defective ossification is more probably attributable to the demonstrable deficiency of di-calcium phosphate in the plasma. The Ca × P product may be taken as a theoretical measure of the severity of rickets and the effect of treatment, but in ordinary cases no change is found in the calcium value, and for practical purposes it is only necessary to estimate the phosphorus. A reduction of the calcium in the plasma occurs in tetany, but it is incidental and

[1] Boston Med. and Surg. Jour., Sept. 8th.

transitory and should not be regarded as showing that there are two independent types of rickets. The initial factors responsible for the lack of phosphorus in the plasma have never been completely determined in spite of much research, including experimental production of rickets in young animals. E. A. Park and others found that the two dietetic factors necessary for its development were (1) low or unbalanced intake of calcium and phosphorus, and (2) lack of vitamin D.

In a paper entitled a Plea for Sanity in the Use of the Modern Methods for the Prevention and Treatment of Rickets, Prof. J. L. Morse suggested that the application of therapeutic measures to alleged cases of rickets was grossly overdone. He considered that the purely radiological evidences of rickets, which were so often regarded as grounds for the use of cod-liver oil or heliotherapy, were so common as to be in all probability physiological, and that consequently a large proportion of current treatment was superfluous and meddlesome. Moreover, the indiscriminate use of artificial sunlight brought with it the possibility both of harm to the patient and exploitation of the public. Dr. K. D. Blackfan referred to a group of cases, clinically and biochemically identical with rickets, in which treatment with cod-liver oil and sunlight was unsatisfactory. He also pointed out that craniotabes, whether it was in reality a sign of rickets or not, was unaffected by these remedies.

A NEW IMMUNITY REACTION.

IN 1917 Rieckenberg discovered that when the blood of an animal, which had been cured of a trypanosome infection, was brought into contact with the causal organism there was a specific adhesion of blood-platelets to the surface of the trypanosomes. More recent investigations of this phenomenon have shown it to be a specific immunity reaction and have extended and modified its scope. It has been shown, for example, that neither platelets nor plasma are essentials, and that what appears to be the same reaction occurs if other small particles—e.g., bacteria—are brought into contact with the trypanosomes in the presence of immune serum. L. J. Davis and H. C. Brown, of the Wellcome Bureau of Scientific Research, investigated this phenomenon early in the current year and showed its practicability as an immunity test and its applicability to spirochætes as well as to trypanosomes. In the current number of the *Journal of Experimental Pathology*, the same authors detail experiments which they have carried out with this phenomenon in an endeavour to differentiate between various species of spirochætes (leptospira). These include a type present in London tap-water, the organism of Weil's disease, the spirochæte isolated by Noguchi from cases of yellow fever, as well as an organism supposed to be causal in the seven-day fever of Japan. The results they publish show that the reaction is one which in their hands gives sharply differentiated results, and whilst the first and last of the organisms we have mentioned behave as independent species, the organisms obtained from infectious jaundice and yellow fever appear identical. This conclusion is in diametrical opposition to the results of Noguchi, who claims on various grounds that the organisms are definitely distinct species. The point raised is rather an important one, as it calls into question the relationship of Noguchi's spirochæte to yellow fever—a problem which cannot yet be regarded as settled. The reaction which we are alluding to is a new departure in the field of immunological tests, and its value is as yet unascertained. From the work of Davis and Brown it would appear probable that it is related to the agglutination test, although it seems to differ from this in requiring the aid of complement, which however need only be present in very minute traces. The authors propose the name of "adhesion phenomenon" for the reaction, which would certainly seem to be a convenient and descriptive term and less barbarous than "thrombo-cytobarin test," which has been used on the continent and which is not accurately descriptive of the reaction as at present performed.

UPWARD MOVEMENT OF THE EYES.

DESPITE the refinement of modern technique and the perfection of biological and diagnostic tests, medicine will never be an exact science, and there are many who lament the passing of the intuitive practitioner of an earlier day. These may take comfort from the presidential address delivered by Prof. Edwin Bramwell last Thursday to the Neurological Section of the Royal Society of Medicine. His review of so apparently simple a matter as the upward movement of the eyes well illustrated his claim that the neurologist must ever cultivate and jealously preserve the wide mental outlook of the biologist. The essential joy for most people in a new discovery is the light that it throws from a fresh angle on well-known facts. We have all played "hunt the thimble" and can remember how absurdly difficult it is to see a conspicuous object if only it be placed above the level of the head. We have all had headache after gazing at high-hung works of art in a picture gallery. We all know that individuals vary enormously in the extent to which they employ facial movements. We have all seen a windscreen wiper ticking mechanically across the glass of a car, though we may not have associated it with blinking. We have all had a chance of observing the slow blinking movements which accompany steady mental activity, just as we may have remarked the rapid flickers of the eyelid that go with emotional tension which has no outlet—helpless anxiety or rage. We have heard that the eyes roll upwards during sleep, we have seen those of a tired companion rotate up under the drooping lids. And we cannot have failed to see the unconscious mimicry of people's mannerisms. In these isolated items of knowledge, however, we are as uncoördinated as the new-born infant which (Prof. Bramwell reminds us) can neither blink nor shed tears, though it can turn its head towards a bright light and turns up its eyes when the tired lids droop—a movement of a lower order than those acquired coördinated movements which are determined by stereoscopic vision.

It remained for Prof. Bramwell to ponder these things and to string the odd beads together into a coördinate chain of links. Why, he wonders, does a person look upwards in disapproval? The devotional upturning of the eyes is understandable; do we "turn up our eyes," in the modern phrase, to appeal for aid against temptation, or to avoid seeing the disapproved object, or to help us in keeping back the verbal expression of doubt or disapproval? Why, again, do we look upwards in mental abstraction? Is it just a release phenomenon, or is it in the hope of inspiration from above? Prof. Bramwell is convinced that the movement is voluntary and purposeful, although it may become a habit. In abstraction the pupils dilate, and it may be that this, together with upturning of the eyes, serves to block out disturbing visual stimuli. Without doubt the majority of such expressional movements are picked up by mimicry, just as speech is, and the mannerism, when dissociated from the conditions that originally gave rise to it, becomes a tic, a habitual purposeless movement. Upward movement of the eyes, so common as a mannerism, is, in Prof. Bramwell's experience, very rare as a tic, perhaps because it attracts too much attention to favour unconscious imitation. Sometimes petit mal patients turn the eyes upwards, and he suggests that a collection of information on this point might prove valuable for prognosis and treatment. Under surgical anæsthesia deviation of the eyes is unusual, he says, though downward rotation spells deep anæsthesia.

The involuntary upturning of the eyes in epidemic encephalitis appears to be a new symptom, associated exclusively with Parkinsonism, of which it may be the only certain diagnostic sign. Prof. Bramwell described

the 11 cases in which he had studied the symptom, and concluded from them that a part was played by fatigue, by agitation, and by self-consciousness. Hyoscine has, he said, a remarkable effect in ameliorating the movements, and it was tempting to suggest that an irritative process played a part in their production. His explanation was that the vertical movements of the eye predominated in the brain stem—a suggestion that raises again the question of "mid-brain epilepsy." The experimenter has never yet succeeded in producing upward or downward movement of the eyes from cortical stimulation, nor has vertical rotation ever been recorded during a fit. The experiments of Risien Russell confirmed the suggestion of Hughlings Jackson that in the cortex the lateral movements of the eyes are so much more powerfully represented than are the vertical movements that they overpower all others when this area is stimulated. Loss of upward movement is pathognomonic of brain stem lesion, says Prof. Bramwell, and this is a far older and more primitive coördinate movement than the lateral movements of which we hear so much. To rotate the eyeballs up is to hark back to a time when all that we have learned from stereoscopic vision was yet untaught.

EXERCISES FOR CHILDREN.

THE Board of Education has just published four additions [1] to its series of manuals on physical training. Nos. 10 and 11 (price 2*d*. each) are short pamphlets concerned with the physical education of boys over 14 years of age. They briefly describe the meaning of physical education, whose object is "not only to improve the physical condition of the pupils . . . but to aid in the development of their mental powers and in the formation of character." To this end it is desirable to include in any scheme systematic physical exercises, games and athletic sports, swimming and dancing. There must not only be suitable instruction and accommodation, but the teacher must be thoroughly trained and must work in conjunction with the medical officer. The Board insists that there should be a daily period devoted to instruction of this kind and suggests 30 minutes as the minimum, preferably in the morning. The pamphlets do not describe any of the exercises, but refer the reader to the "Syllabus of Physical Training for Schools," 1919, and to the new "Reference Book of Gymnastic Training for Boys" (No. 13 of the series, price 3*s*. 6*d*.). This "Reference Book" of 322 pages is devoted to a description of the Swedish system, and gives a full and clear account of hundreds of exercises for boys between the ages of 8 and 18, each being designed for some particular physiological effect. The theory underlying these exercises is discussed, and the best method of teaching is clearly set out, often with diagrams. In the introduction Sir George Newman shows that recent educational developments have demanded a wider interpretation of "physical exercises" and explains that the Swedish system has been adopted as the best method for giving systematic training "to secure certain definite results which can be more or less exactly controlled." It may be, however, that dependence on specific series of movements for individual purposes is not physiologically sound, except in cases of organic, surgical, or paralytic defects; for the rounded back or the protuberant abdomen is an expression of general unfitness, as also are most of the other minor postural and muscular weaknesses commonly met with in children. They are best countered by a healthy environment and by the natural movements of games or dancing which quicken and hold the interest. Systematic exercises, besides requiring much apparatus, may be too dependent on the personality of the teacher for sustaining attention, whereas simple games can be started in quite early years and the spontaneous play-instinct of the child can be moulded gradually into the communal habits of self-discipline and coöperation with his fellows. The supplement for older girls (No. 12 of the series, price 4*d*.) consists of two parts, the first being a progressive list of gymnastic exercises and the second describing the organisation and practise of many excellent games. Diagrams are given to show how playgrounds can be marked out so as to permit of several games being played at the same time.

[1] Board of Education, Physical Training Series, Nos. 10–13. H.M. Stationery Office.

THE subject of Sir William Willcox's presidential address to the Medico-Legal Society on Thursday next will be Recent Advances in Toxicology and Forensic Medicine. The address will be given at 11, Chandos-street, Cavendish-square, at 8.30 P.M.

Prof. C. Y. Pearson has resigned his post as professor of surgery at University College, Cork, as from the end of October, but is not retiring from active practice, in the pursuit of which he will have the best wishes of many friends. For a long period he has been one of the best-known members of the surgical profession in the south of Ireland, and some years ago was appointed honorary surgeon to the King in Ireland.

Mr. Lionel Colledge will deliver the Semon lecture for 1927 in the Barnes Hall of the Royal Society of Medicine, 1, Wimpole-street, on Thursday, Nov. 3rd, at 5 P.M. His subject will be the Present Position of Laryngectomy for Cancer of the Larynx, and Mr. Harold Barwell, President of the Laryngological Section of the Royal Society of Medicine, will take the chair.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg. Comdr. M. W. Haydon is placed on the Retd. List with the rank of Surg. Capt.

W. J. Moody, W. C. Munro, R. D. Stuart, and J. C. Gent to be Surg. Lts.

Proby. Surg. Lt. W. E. Lascelles to be Surg. Lt.

Surg. Cmdrs.: H. E. Y. White to H.M. Yacht *Victoria* and *Albert*; G. S. Harvey to *Pembroke*, for R.N. Barracks, Chatham, for course, and to *President* for course, and to *Vivid*, for R.N. Barracks, Devonport, for anti-gas school; E. C. Holtom to *President*, for Porton Experimental Station; D. H. C. Given to *President*, for three months' post-graduate course; and K. D. Bell to *Victory*, for Royal Marine Infirmary, Portsmouth. Surg. Lts. E. H. Rampling and C. R. Boland transferred to permanent list.

ROYAL ARMY MEDICAL CORPS.

Capts. to be Majs.: J. H. C. Walker, M. B. King (Prov.), and R. H. Graham.

Capts. to be Majs. (Prov.): Bt. Maj. W. Hunt (and remains secd.) and H. S. Moore.

Temp. Lt. P. J. Malone, Dental Surg., to be temp. Capt.

Temp. Capt. H. M. Hart-Smith relinquishes his commn. and is granted the rank of Capt.

ARMY DENTAL CORPS.

Lt. F. H. R. Davey to be Capt.

TERRITORIAL ARMY.

Capt. A. F. Wright resigns his commn. on reduction of estabt. and retains his rank.

Capt. H. M. Anderson resigns his commn. and retains his rank.

C. L. Broomhead to be Lt.

J. G. Weston (late Offr. Cadet, Univ. of London Contgt., Sen. Div., O.T.C.) to be Lt.

TERRITORIAL ARMY RESERVE OF OFFICERS.

Lt.-Col. F. T. Rees, Active List, to be Lt.-Col.

ROYAL AIR FORCE.

Flight Lt. T. W. Wilson is granted a permanent commission in his rank.

A. W. Comber is granted a temporary commission as Flight Lt.

INDIAN MEDICAL SERVICE.

Maj. R. W. G. Hingston retires.

Modern Technique in Treatment.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

CCXLVI.

THE TREATMENT OF LOBAR PNEUMONIA, BRONCHO-PNEUMONIA, AND BRONCHITIS IN CHILDREN.

II. THE TREATMENT OF SPECIAL SYMPTOMS.[1]

Sleeplessness.

SLEEPLESSNESS should be prevented from the start. Nothing so exhausts a child as a succession of sleepless nights, and in a severe case the promotion of sound sleep from the outset may turn the scales. When drugs are given the dosage must be effectual; the hypnotic which fails may do more harm than good. In the early stages, and in many cases throughout the attack, potassium bromide and chloral hydrate, or syrup of chloral, are the best. Children take both well. Tepid sponging often helps to send a child to sleep in conjunction with these. If these milder remedies fail the problem of the use of opium and morphia arises. In an adult this question becomes more delicate as the crisis is approached; in the child an even nicer judgment is required on account of the intense and varying susceptibility of children to opium and its derivatives. There is, however, no doubt as to its value, and in some cases life may depend on correct and timely dosage.

To a child of 3, 1 minim of tincture of opium or 1 gr. of Dover's powder may be given. The dosage in each case must be judged with especial reference to the amount of respiratory distress. It is well to err on the side of under dosage at first and repeat if sleep is not obtained. Morphia is best given hypodermically combined with atropine, which tends to diminish respiratory distress; with the same caution morphine hydrochloride gr. 1/20 may be given to a child of 3. Heroin is said to have a less depressant effect on the respiratory centre, but I prefer to give morphine itself rather than be lulled into a false sense of security by giving heroin.

Pain.—Pyrexia.

Pain in the chest may cause restlessness and lack of sleep and can be relieved by local applications. Since the soft bony framework of a child's chest is easily compressed, any heavy application likely to impede respiration should be avoided. Antiphlogistine or thermogene wool applied to the affected side, or methyl salicylate ointment, are the best local applications. In older children pain from a localised patch of pleurisy may be relieved by immobilising the affected side with strips of adhesive plaster. A mustard leaf will sometimes give relief.

Pyrexia.—Antipyretic drugs should not be given. For a prolonged temperature of over 104° F. tepid sponging is effective and comforting. Start with water at a temperature of about 90° F. and cool while sponging by the addition of cold water. The temperature of the child should be watched and sponging should not be continued after this has fallen to 101° F. by the rectum.

Cardiac Failure.

Much may be done to lessen the strain upon the heart by preventing respiratory distress. When any tendency to cyanosis shows itself, or the secretion in the tubes appears to be interfering with easy respiration, atropine should be given. By drying up excess of secretion and causing the bronchial tubes to dilate, this allows air to pass freely into the alveoli and oxygenation is facilitated. Children stand atropine well; gr. 1/100 may be given hypodermically three times a day to a child of 3, and in severe cases four-hourly. The value of stimulants is problematical. In weakly children, or those in whom there is any abnormal rapidity or feebleness of the pulse, it is well to give a stimulant from the start.

The following is a useful mixture, given three times a day for a child of 3: spiritus ætheris ℥v., spiritus ammon. arom. ℥v., aqua ad ℥i.

There is considerable difference of opinion as to the value of brandy in treatment. Some authorities maintain that it is unnecessary and may even be harmful. Personally, I find it a most valuable stimulant in severe cases and have never observed any ill-effects from its use. Thirty minims may be given four-hourly to a child of 3 directly any tendency to cardiac weakness appears; the dose may be increased to one teaspoonful or more if necessary. Brandy should never be given until there is definite need of a stimulant. Adrenalin appears to be of value in some cases; ℥v. (1 : 1000) may be combined with injections of atropine. Strychnine should be given cautiously to children who are very sensitive to it. In cases of sudden cardiac failure a small and isolated dose is of value; it should only be repeated at long intervals. The value of camphor as a cardiac stimulant is indefinite. For a single dose gr. ½ dissolved in olive oil may be given intramuscularly to a child of 3, or gr. ¼ if the dose is to be repeated at six-hourly intervals. Digitalis is often given to children, but I have never observed any benefit from its use. For collapsed children under 2 years old a mustard bath is the most valuable stimulant. One heaped tablespoonful of mustard is added for each gallon of water in the bath, which should be as hot as can be safely borne, the body being completely immersed for from two to five minutes. The child should then be dried quickly in a warm towel and put straight into bed.

Expectorants.

In mild lobar pneumonia these are not indicated during the first few days. When there is bronchitis, or the cough becomes dry and irritating, small doses of ipecacuanha, squill, and ammonium carbonate are useful. A linctus containing a teaspoonful of equal parts of glycerine and syrup of virginian prune, or of equal parts of compound tincture of camphor, oxymel of squill, and syrup of balsam of tolu is good. The bronchitis kettle will often relieve a dry and irritating cough, especially if there is some laryngitis. When there is obvious respiratory irritation from excess of secretion in the bronchial tubes, which an ineffective cough fails to relieve, a single emetic dose of ipecacuanha is of great use.

Fresh Air Treatment.—Oxygen.

Treatment in the fresh air is unnecessary for the simple case of lobar pneumonia. In certain cases of severe lobar pneumonia and broncho-pneumonia with cyanosis and much respiratory distress, removal to the open air causes immediate and marked improvement. If a spot well sheltered from the wind and rain is obtainable in a garden or on a balcony and the child is in the hands of an efficient nurse, the treatment is very valuable. In the absence of these facilities it is better avoided.

Oxygen Administration.—For patients with cyanosis oxygen is useful. It should be given for periods of 15 minutes once every hour, through a catheter introduced into the nose. Administration by means of a funnel held a few inches from the nose and mouth is a bad method and probably of no benefit whatever.

Specific Treatment.

The serum treatment of lobar pneumonia has so far only been doubtfully successful, and that only in cases due to Type I. pneumococcus. To get the maximum effect it must be given as early as possible, in large amount, and by the intravenous route. In many children it is impossible to obtain sputum to determine the type of infecting pneumococcus and serological tests are necessary. The giving of serum

[1] The first section of this article—General Considerations—appeared last week.

by the intravenous route to children is very difficult, especially in private practice, and as the infection is much less dangerous than in adults, the scope for specific treatment is less. It may possibly be of use in older children when means for rapid serological diagnosis are at hand.

Complications.

Empyema.—In pneumonia, from the start a close watch must be kept for the development of an empyema. In children the physical signs of this complication are often misleading. In the early stages the most definite sign, displacement of the heart, is absent, while the others are often indefinite. Breath sounds are often not diminished over a thin layer of pus, and high-pitched tubular breathing is often present. Owing to the ease with which sounds are conducted in a child's lungs the sounds may be similar but slightly less on the unaffected side, and it is easy to suspect the empyema on the wrong side. For these reasons the physical signs are less helpful than in an adult, and in cases of doubt it is wiser to make certain by exploration. Should the temperature continue after pus has been found and evacuated, the possibility of a double empyema must not be forgotten. Before resorting to exploration great care must be taken to exclude other causes of continued pyrexia. Examination of the ears, throat, or urine is sometimes forgotten. The treatment of empyema has already been dealt with in this series.

Abdominal distension should be treated in its early stages, for once paralytic ileus has developed very little can be done. A less fluid diet should be given and an abdominal binder worn. Turpentine enemas, rectal wash-outs, or the passage of a high rectal tube may assist in the evacuation of flatus. If distension increases pituitary extract may be given; 0·20 international units intramuscularly is a safe dose for a child of 3. For persistent vomiting the stomach should be washed out.

Convalescence and After-treatment.

Fresh air and avoidance of chill, nourishing food, a tonic, and a graduated return to normal life are the chief convalescent requirements. A holiday in the country or by the sea may be needed.

An attack of pneumonia in a child is an important fact in its medical history and should never be forgotten, especially during a future attack of measles, whooping-cough, or influenza. The possibility of a residual fibrosis of the lung must be remembered, particularly in a child who has had the good fortune to recover from an attack of broncho-pneumonia.

LESLIE B. COLE, M.D. Camb., M.R.C.P. Lond.,
late Resident Assistant Physician to
St. Thomas's Hospital.

Special Articles.

THE NORMAN KERR MEMORIAL LECTURE ON THE TOBACCO HABIT.

Delivered on Oct. 11th before the Society for the Study of Inebriety

BY PROF. W. E. DIXON, M.D., F.R.S.,
ASSESSOR TO THE REGIUS PROFESSOR OF PHYSIC, CAMBRIDGE.

[Prof. Dixon commenced by saying that Dr. Norman Kerr, in whose honour the Memorial Lecture was delivered, had himself written on the evils following the tobacco habit. After a brief sketch of the history of tobacco, the circumstances in which it was introduced into Europe, and the various attempts at prevention by authorities, royal, clerical and military, the lecturer pointed out that smoking had become universal throughout the world, adding that in this country no serious attempt had been made to determine its effect on the public health. He continued:]

Composition of Tobacco Smoke.

The smoke emitted from any smouldering vegetable matter, including tobacco, contains ammonia gas and pyridine or pyridine derivatives, and it is these substances which produce the irritation of mucous surfaces not infrequently observed in those who smoke; these bodies are responsible for the morning cough, the irritation of throat and tongue, and the conjunctivitis of the cigarette smoker. They are in every respect objectionable products and add nothing to the pleasure of smoking. If they could be excluded from the smoke it would be all to the benefit of the smoker. Other dried herbs such, for example, as coltsfoot leaves, at one time sold as a harmless boy's tobacco, often produce more pyridine when allowed to smoulder than tobacco, but they have none of its calming effects.

The pyridine bases are oily volatile liquids, intensely irritant, but compared with nicotine of a relatively low toxicity.[1] Their poisonous nature I have demonstrated on young volunteers who were required to smoke coltsfoot leaves; after smoking for some time, 20–30 minutes, they suffered from nausea, vomiting, and diarrhœa, with all the signs of early shock.[2] Nevertheless in tobacco smoking the only serious effect of these bodies is the local irritation, since their specific effects are insignificant in comparison with those of other substances which are present in this smoke.

Carbon Monoxide.

Another substance obtained from the slow combustion of almost any vegetable matter, including tobacco, is carbon monoxide, which is also the poison of coal-gas and the exhaust gas from motor-cars.

In New York and Newhaven, where the motor traffic is dense, CO can be detected in the air of the streets.[3] The traffic control men not infrequently suffer from headache, slight nausea, muscular weakness and rapid pulse, which are the usual symptoms of CO poisoning. Wilson and others [4] examined the blood of 14 foot traffic patrol men and found that their blood contained from 0–30 per cent. of CO, whilst six of these men showed values of from 20–30 per cent. Two other symptoms which are also prevalent are dizziness, and, more rarely, dimness of vision.

The U.S. Bureau of Mines made experiments to determine the CO present in a confined space after intensive smoking, and found that the CO concentration of the air of the room did not rise to more than 0·01 per cent., and the maximum blood saturation of the subjects exposed to this atmosphere was only 5 per cent. Nevertheless this is more than enough to affect seriously sensitive people. When the amount of this gas is determined in the smoke of cigars, cigarettes, and pipes under conditions simulating as far as possible those obtaining during ordinary smoking, the figures obtained are somewhat alarming.[5] The cigarette smoke yields from ½ to 1 per cent.; the pipe 1 per cent. or more, and the cigar 6 to 8 per cent.; this last, as Prof. Armstrong points out, is roughly the proportion of CO in the coal-gas of the South Metropolitan Company. The amount of CO varies naturally with the rapidity of the smoking and the closeness of the packing—the quicker the smoking the more CO.

Tobacco smoke, however, reaches the mouth freely diluted with air, and the amount of CO absorbed from the buccal cavity is negligible, so that pipe and cigar smokers who do not inhale have little to fear from this poison. Cigarette smokers who inhale would absorb a large proportion of the CO which reaches the lungs, since the affinity of CO for blood is more than 200 times that of oxygen. Cigarette smoke as it reaches the mouth of the smoker may contain as much as 7·2 to 25 parts of CO in 10,000 parts of air (Baumberger). Inhaled for one hour at the rate of five puffs a minute this should be enough to affect

appreciably the blood hæmoglobin. Many years ago Fokker asserted that animals placed in an atmosphere containing tobacco smoke died from CO poisoning. Hartridge [6] found 6 per cent. CO in the blood in one cigarette smoker who was by no means excessive in his habits. The normal healthy man does not in most cases show symptoms of CO poisoning until 15 to 20 per cent. of his hæmoglobin has been fixed and put out of action. Yet there are many people who show a supersensitiveness to this poison, just as some of us have some idiosyncrasy for quinine or iodides, and so it is not difficult to appreciate why cigarette smokers may exhibit a syndrome indistinguishable from that of mild CO poisoning.

The toxic concentration of CO in the atmosphere is about 0·05 per cent.; in men exposed to dilute concentrations such as 0·02 per cent., the degree of hæmoglobin saturation would be perhaps somewhere near 20 per cent.[6a]

Nicotine.

The third and by far the most important constituent of tobacco is the volatile alkaloid nicotine. The effects of cigar and pipe smoking are due practically entirely to nicotine which exists in tobacco combined with organic acids. During smoking these salts are largely dissociated, a part of the nicotine being burnt, and a part passing in the smoke as free nicotine. The drier the tobacco the greater the destruction of the nicotine. Moist tobacco produces much more serious effects than dry tobacco, and it has been stated that the moistness of the tobacco is responsible for many of the evils. The water content of the tobacco is much more harmful to the smoker than the original nicotine content of the tobacco.

During the slow combustion of a cigar, as in ordinary smoking, there is an area immediately behind the point of combustion in which the water and other volatile substances condense. During aspiration the hot gases are drawn through this hot moist area and carry with them the volatile principles of which nicotine is the most important. Hence the smaller this moist area behind the point of combustion, which means the cooler the smoke or the more complete the combustion, the less likely is the smoke to contain volatile toxic bodies. It follows that a cigarette or slender cigar which is well cooled will yield fewer of these products than a thick cigar, and many smokers can testify that a fat cigar has a much greater effect than a long slender cigar of similar tobacco. This also explains the unpleasant effects of relighting a half-finished cigar or pipe.

The same principle is exemplified by the following fact. Virginian tobacco leaf from which cigarettes are made often contains double the amount of nicotine that is present in Manilla cigars. Yet when an equal weight of the cigarettes and cigars are smoked the total cigar smoke contains double the amount of nicotine present in the cigarette smoke. The condition of the tobacco and the form in which it is smoked are more important factors in determining the amount of nicotine in the smoke than the amount of nicotine present in the original tobacco.

The species of plant mostly used is *N. tabacum*, but several other species are employed, thus *N. rustica* yields Turkish tobacco; different varieties of tobacco from the same species also show different amounts of nicotine. During the process of curing the leaves, which consists in exposing them under cover to a considerable degree of heat, important chemical changes occur, the leaves become moist and their fragrance alters. There is much room here for further investigations with a view to producing a tobacco which when smoked would yield in the smoke the minimum of alkaloids, pyridine, &c., whilst retaining its aroma. Tobacco may contain anything from 1 to 8 per cent. of nicotine; Havana tobacco has about 1·5 per cent.; Maryland, 2 per cent.; Virginia, 6 per cent.; Kentucky, 8 per cent.

Amount of Nicotine in Smoke.

The amount of nicotine in tobacco is no criterion of the amount in its smoke. For example, mild Honeydew contains only 1·6 per cent., whilst Cavendish may contain as much as 3·8 per cent.; if these two are smoked under identical conditions the Cavendish naturally yields the larger amount of nicotine in the smoke. But Cavendish smoked in a cool pipe, or one provided with a filter, will affect the smoker less than the Honeydew smoked in a hot pipe. In the churchwarden pipe the opportunity for the nicotine to condense is such that the smoke is almost freed from the alkaloid; and I have already pointed out that in cigar and cigarette smoking the degree of moisture, the tightness of packing, and the thickness of the cigar or cigarette are the most important factors in determining the amount of nicotine which will be present in the smoke.

Habermann [7] and Ehrenfeld state that two-thirds of the nicotine of some kinds of cigars passes over in the smoke; with other brands as little as one twenty-fourth passes over. Lehmann [8] obtained nicotine from the air of a room in which tobacco was being consumed, showing that the smoke puffed out is by no means denuded of all its alkaloid. He thinks from his calculations that only about 1·4 mg. nicotine are absorbed from a cigar. This figure depends on so many conditions that it cannot be accepted; for example, the length of time that the smoke is held in the mouth, thus affording time for absorption, would exert an enormous influence. Our own observations suggest that the figure is ten times too small. The collapse which I have seen in youths smoking a Manilla cigar could not have been obtained by the absorption of such an amount.

Asherton, 1919, says that 6 to 8 mg. of nicotine reach the mouth from a cigarette smoked in the usual way. We are not told, however, how much of this is likely to be absorbed. In our own observations, using a standard Virginian cigarette weighing 1 g. and aspirating the smoke through solvents once in 12 seconds and using only three-fourths of the cigarette, it was found that 3 mg. of nicotine were absorbed. It must not be assumed that all this is necessarily absorbed into the system, but in the case of an inhaler most of it certainly is, perhaps 75 per cent., since expectoration is no longer permitted and loss can occur through the exhaled smoke only. Hence if a cigarette smoker were to puff ten cigarettes on end he would certainly absorb 20 to 30 mg. of nicotine, enough to produce a profound physiological effect, though administered in this way perhaps 10 to 15 times under the lethal dose. The amount of nicotine in pipe and cigar smoking is much higher. In our experiments cigar smoke contains about twice as much nicotine as cigarette smoke.

Other constituents of tobacco smoke are less important. The solids of cigarette smoke weigh about 10 per cent. of the tobacco burned—that is, 80 mg. for each cigarette. Cyanides and sulphocyanides are present in traces, arsenic is a constituent of American tobaccos in amounts many times greater than those permitted in foods. Pipe tobacco is reported to contain the equivalent of from 0·05 to 0·27 gr. As_2O_3 per pound.[9] When smoked probably about half this will be absorbed.

These facts show that nicotine is a most important constituent of tobacco. It is one of the most fatal and rapid poisons known; it acts as quickly as prussic acid, and 2 drops placed on the tongue of a dog will kill it almost immediately. The lethal dose for a man is 60–120 mg. The nicotine present in one cigar if injected intravenously would represent two fatal doses to man. It is therefore somewhat remarkable that fatal nicotine poisoning is not more common. Nevertheless, the careless use of tobacco infusions in enemas, the occasional swallowing of tobacco leaves, or even carrying tobacco leaves next to the skin for smuggling purposes, have all led to fatal results.[10] Tobacco has also been used for criminal purposes,[11] but as it does not appear to undergo fermentative changes in the cadaver it can be detected in the bodies of animals three months after death.

[Prof. Dixon then reviewed the subject of denicotinised tobacco, the various methods of removing

nicotine suggesting to him that great opportunities still existed for the investigation of tobacco.]

General and Specific Action of Tobacco Smoke.

Tobacco used in any form possesses irritant properties; this is, of course, obvious with snuff, the use of which depends on stimulation of the fifth nerve-endings. The same action occurs in chewing which excites reflex salivation. If 5 or 6 gr. of tobacco are swallowed vomiting occurs. Tobacco is irritating also to the skin, and the alkaloid in it is readily absorbed. Many cases of poisoning are on record, and I have in mind particularly a child of 8 years suffering from tinea capitis to whose head the expressed juice of tobacco leaves was applied; the treatment was shortly followed by the death of the child. Several cases of tobacco poisoning from the skin are reported in the *British Medical Journal* for 1926. Garvin, in 1913, described the case of a girl aged 6 years who died 45 minutes after receiving an enema of 24 gr. of tobacco. From an examination of such cases it is clear that death may occur from three minutes to several hours, after using tobacco as an enema or for application to the skin.

Continuous smoking for several years not infrequently produces signs of chronic irritation in the mouth, throat, and larynx—sore tongue, morning cough, hoarseness, tonsillitis, or chronic bronchitis. I believe that these effects are most marked in the cigarette inhaler. When the smoke is concentrated on one portion of the tongue for many years, which may occur especially in pipe smoking, this constant irritation is said to favour the formation of epithelioma of the lip and tongue if the quantity consumed is large or the smoker predisposed. The evidence in support of nicotine taking any part in this action is certainly not conclusive. Nevertheless, Bottini mentions 100 cases of cancer which he saw, including three women, which were caused by smoking or chewing tobacco. On the other hand, the Registrar-General's report shows a remarkable fact, to which attention has not been drawn previously, that tobacco manufacturers have a lower death-rate from cancer than those of any other trade.

Smoking is reputed amongst the public to have an antiseptic action, and is sometimes indulged in nominally for this purpose. Pepys describes the use of tobacco during the plague, and its use was compulsory at Eton in 1721 as a prophylactic against "the apprehension." Puntoni[12] and others have shown that tobacco smoke has a strong disinfectant action in vitro. When the smoke is drawn into the mouth, however, the action is attenuated by the saliva and mucosa, and its antiseptic effect is negligible. The action in vitro is not influenced by filtering the smoke free from nicotine by passing it through cotton-wool.

Smoking is, however, indulged in by man because of its sedative action, and this is due solely to nicotine absorption. Nicotine stimulates all nerve-cells throughout the body without exerting any kind of selective action, and the stimulation is followed by depression. The time the stimulation lasts depends on various factors, but as a rule it coincides with the absorption of the nicotine—that is, with the period of active smoking. Both the pleasure and evils of smoking are intimately connected with nicotine. Morphine, heroin, cocaine, and the other drugs of addiction have a selective action on the central nervous system alone; nicotine is different, it acts also on the autonomic nervous system, and it is this action which produces objectionable effects in the sensitive or excessive smoker.

Alimentary Canal.

The commonest symptoms of smoking are loss of appetite and chronic intestinal catarrh. The smoker's lack of appetite, Sir Humphry Rolleston thinks, is not altogether an evil, since it limits the consumption of unnecessary food. Nicotine and tobacco smoking, by stimulating the autonomic ganglia, increase the secretion of the alimentary glands and later, after the smoking has ceased, depress them; hence the salivation during smoking and the dry mouth the following day. The same fact is true of gastric secretion. Experiments have been made on dogs with a Haidenhain's fistula, by means of which the secretion of gastric juice may be collected and examined as desired. Injections of nicotine, or saline solution through which smoke has been passed, into these animals afford a means of determining accurately the effect on gastric secretion. Both affect the dog in the same way and cause at first a decided increase in gastric secretion.[13] It is well recognised that in certain persons excessive smoking leads to this gastric hypersecretion; hyperacidity is the most common disturbance and gastritis acida is one of the most frequent results. Hurst[14] believes that tobacco smoking is one of the most frequent causes of hyperchlorhydria. Rolleston[15] lays considerable stress on the relative sensitiveness of the individual as an important factor in determining whether or not a heavy smoker will pay the penalty of gastric disease.

On the musculature of the alimentary canal the action of tobacco is equally well marked, the automatic movements are first inhibited and later augmented as a result of stimulation and later depression of the autonomic nervous system.[16] The inhibitory stage is almost coincident with the period of smoking, and is associated with contraction of the pyloric and ileocolic valves. Stimulation of the sympathetic nerves causes inhibition of the whole alimentary canal with the exception of these two valves which are contracted. The dyspepsia often following on a hypodermic injection of morphine is probably due to this pyloric contraction which delays the passage of food. Morphine in this respect shows some similarity to nicotine.

The mild laxative action of tobacco smoke may be explained by the ultimate depression of the inhibitory cells whereby the motor nerves assume an undue influence on the automatic movements. Hunger is due to certain well-recognised automatic contractions of the stomach; smoking definitely inhibits these. Hence continuous smoking staves off the pangs of hunger and acts in this respect like the drugs of addiction, cocaine and morphine. Careful experiments which have been made on habitual smokers and non-smokers with the aid of bismuth and X rays show that the effect of smoking a cigar is to stop the normal automatic movements of the stomach within 15 minutes. The inhibition continues until about three minutes after smoking has ceased, when the contractions recommence.[20] In these experiments it was also shown that nausea and vomiting from excessive absorption of nicotine may occur at a time when the stomach movements are completely inhibited.

Tobacco smoking, then, has a very definite action on the alimentary canal. In certain sensitive people it produces effects which, according to Hurst, favour the production of duodenal ulcer, whilst Wagner[21] insists that excessive smoking can produce all the subjective and X ray appearances of this condition.

Effects on the Circulation.

The considerable use of tobacco in any form invariably produces certain definite effects on the circulation which cause no inconvenience of any kind to the subject; these should be distinguished from other effects which only occasionally occur, but are then often sufficiently distressing to induce the sufferer to seek medical advice.

Under the first group must be included changes in the pulse-rate. All observers are agreed that the use of tobacco increases the pulse-rate from 5–10 beats a minute, and in the case of the man who is continually smoking the increase of rate becomes permanent, but this condition produces no apparent disadvantage. When the novice or moderate smoker puffs a cigar the rate of the pulse increases in a few minutes. Lee,[19] working in my laboratory, demonstrated this clearly both in the novice and moderate smoker under strict experimental conditions. In another series of experiments 28 young healthy smokers were required

to smoke a single Turkish cigarette; the pulse-rate increased in all but four, and 16 showed an increase of more than eight beats per minute.[20] Hesse [21] obtained similar results with cigars on 25 patients suffering from various chronic diseases.

During the war it was generally asserted that excessive smoking, particularly of cigarettes, was the common cause of the so-called D.A.H. Observations were made which showed that the average pulse-rate of the patients during smoking was nine beats per minute higher than before smoking; in ten healthy controls it was six higher.[22] As there can be no question that the effect is due to nicotine, inhalers of cigarette smoke should show more acceleration than non-inhalers. In Parkinson's 20 patients the 10 inhalers showed an average increase of pulse-rate of 11 per minute and the 10 non-inhalers of 7.

This increase in the pulse-rate is associated with a small rise in blood pressure; for the moderate smoker the rise does not usually exceed 20 mm. of Hg systolic and 8 mm. of Hg diastolic, and is usually even less. The rise begins a few minutes after the smoking has commenced, and is maintained throughout the smoking period.[21 23] It is only in the case of the novice or after excessive smoking that the blood pressure falls to any extent below normal after the smoking has ceased; but under certain conditions the fall may be so severe as to cause all the signs and symptoms of shock or collapse.[22]

Observations have also been made to determine the effect of smoking continued over a period of six months. Nicolai and Staehelin smoked six or eight cigars a day for six months. They then gave up smoking except for an occasional cigar for a further six months. Their average pulse-rate was 74·5 compared with 81·8 during the smoking period.[24]

These changes from the normal are after all usually small and give rise to no symptoms, but the evidence available suggests that they cannot be regarded with indifference. It is a maxim with those who are in training for athletic events that smoking must be entirely eschewed. This prohibition, no doubt adopted in the first place as the result of experience, has become a tradition. In Nicolai's experiments the acceleration of the pulse which occurred after the performance of a measured amount of work with the ergograph was considerably greater during the smoking period, while recovery to the normal rate was much slower than during the period of abstinence. Parkinson and Koefod also showed that smoking a few cigarettes can render healthy men more breathless on exertion, and that this effect was marked in soldiers suffering from D.A.H. This means that the heart even of the moderate smoker is less efficient in periods of strain. It is possible, then, that the prohibition of smoking for athletes is dependent on this vascular effect. With present knowledge it would be mere speculation to attempt to gauge the significance of this factor when continued over many years.

Of the more definite effects which cause patients to seek advice are palpitation and arrhythmia which are relatively common in the young; they disappear if the smoking is stopped, though in pronounced cases, as the late Sir Clifford Allbutt pointed out, only after the abstinence has been continued for many months. The arrhythmia is functional and is usually due to extra-auricular systoles. Neuhof mentions fibrillation and flutter and sino-auricular block also; the block in the case he illustrated disappeared three days after the smoking ceased,[25] but such cases must be very rare. Rolleston says that arrhythmia may occur at any age, but is more noticeable after 50; this may be due to a loss of tolerance which is known to occur in later life, and to which I must refer again. Another symptom which may arise from excessive smoking in later life is anginoid pain, which, according to Osler, rarely approximates to true angina. Turney says that it is associated with vaso-motor disturbances and tends to occur after meals or in the night rather than after exertion.

Arterio-sclerosis is easily produced in animals, especially rabbits, by the injection of nicotine, and we have ourselves produced marked arterial changes in the aorta and larger arteries of animals by administering to them "smoke water"; but I do not think that these experiments are proofs that smoking leads to arterio-sclerosis in man, although there is a consensus of clinical opinion that immoderate smoking favours arterio-sclerosis. Pawinski [26] states that 42 per cent. of 1000 cases of coronary sclerosis had histories of immoderate smoking.

In severe cases the cardiac irregularities may lead to syncope, and an undue proportion of sudden deaths occurring during the middle period of life without any definite lesion being found post mortem is said to be found in heavy smokers.[19] As even the most moderate smoking places some disability on the heart, trifling though it be, it may well be that this view deserves serious consideration.

Central Nervous System.

Nicotine is essentially a nerve poison, but so far consideration has only been given to its action on those cells on the course of the autonomic system, and this action is responsible for the digestive and circulatory effects. But nicotine affects the brain and cord also; it increases spinal reflexes and removes certain inhibitions.

I have already drawn attention to some of the effects of excessive cigarette smoking in the young, the attacks of giddiness and the tremors. A large experience of examination papers of medical students enables me to pick out with certainty the heavy cigarette smokers from the irregular character of their writing. If the habit is broken the writing at once improves and the vertigo disappears. These effects are exactly those of CO poisoning and I believe can be explained on this basis.

Habitual smokers are agreed that the weed acts as a mild sedative to the central nervous system; the type of action is of a somewhat remarkable character and may offer an explanation of the widespread use of tobacco. Physical fitness or well-being is determined by our feelings, which are the result of sensations. If response to sensation varies from the normal, whether on the hypo- or hyper-side, rest causes a return towards the normal, and smoking is said to exert a similar effect though of a more marked description, and hence the sedative effect of tobacco in conditions of irritation, and the stimulating effect in those of weariness and depression. The experiments from which these statements were deduced consisted in determining the threshold to single break induction shocks of two fingers immersed in saline solution. After this figure was determined the subject smoked two cigarettes and his threshold was re-examined. If the initial threshold was low, smoking depressed it on an average 72 per cent. On the other hand, if the initial threshold was high, smoking lowered it on an average 28 per cent. Suitable controls were made with cubebs cigarettes which always acted as a stimulant. This shows also that the tobacco action is due to nicotine.[27] In the same way smoking tends to nullify the slight sensory depression produced by the veronals, antipyrine and other hypnotics.[28] So that it may well be that tobacco is helpful when the sensory threshold is abnormal.

Mental Efficiency.

Mental efficiency tests on the whole have not been very convincing. In Berry's experiments [29] smoking enabled his subjects to do more rapid and correct arithmetical addition, but the nicotine here was not the determining factor, the aroma had some effect, and holding an unlighted cigar or chewing substances like gum all had some effect. Turney lays much stress on the importance of these tics. Carver's experiments consisted in applying eight established psychological tests in a number of people to determine whether cigars or cigarettes would influence their judgment and response to stimuli. The results suggest that smoking lowers the accuracy of finely coördinated reactions and association-thought processes. The speed of complicated reactions was, how-

ever, unchanged. The habitual smoker when deprived of his smoke for some hours showed diminished accuracy.[29]

Many observations have been made by merely comparing the efficiency, mental or physical, of smokers and non-smokers. All these experiments seem to me so difficult to interpret that their value is negligible. Generally they show some inferiority of the smokers. This is true of observations of scholarship,[31] endurance of telegraph workers,[32] scholarship and physical efficiency at Antioch,[33] and resistance to tuberculosis.[34] The apparent inferiority may be the cause or the effect of the tobacco habit. Those who are handicapped by neurosis or other form of inferiority would succumb most easily to the euphoria of smoking.

The action of smoking on the performance of routine muscular work has also been examined, and it has been found that habitual smoking has no obvious effect on the output of work amongst glass blowers, a moderately strenuous physical occupation, although chewing greatly diminished the output.[35] On the other hand, Lombard's experiments show that smoking diminishes muscular endurance both at the age of 35 and 60.[36] Using the ergograph Palman found that cigarette smoking at first increased muscular work, but that fatigue set in earlier and the total work was less. A curious periodicity occurs in the ergograph records after smoking, due to fatigue or depression of the central nervous system.[37]

It must be conceded that ordinary smoking in normal people does not lead to nervous disturbances. Excessive smoking is another matter and may produce anxiousness and insomnia. Every smoker knows that a stronger cigar than usual may keep him awake, though usually the effects of smoking are soothing and favour sleep. Neurasthenic subjects are easily affected by smoking, they are continually breaking off their smoking and returning to it again in a few weeks. They suffer from headaches, dizziness, and sudden sharp attacks of pain in the head, over the precordial region or in the stomach, which cease when the smoking is stopped.[38] Neuralgias generally stated to be localised about the intercostals, humoral and scapular region are rare but of importance, as until the cause is removed the pain continues.

The action of tobacco, then, on the central nervous system when used in moderation on the whole does no harm, and in subjects showing deviations from the normal it makes for good.

Amblyopia.

Tobacco amblyopia stands alone in mischiefs so grave. It was noticed by Mackenzie in 1835, and observed accurately by Hutchinson in 1864. The sight gradually becomes dim with central scotoma, some derangement of accommodation and often dilatation of the pupil. This condition is associated with retrobulbar optic neuritis, and recovers if smoking is stopped; when degeneration has set in, however, abstaining from nicotine will only arrest further progress.[38a]

At one time those engaged in the manufacture of tobacco, in consequence of the absorption of powder, suffered from visual troubles. Dr. Norman Kerr stated "in 3000 workers in a tobacco factory 150 had eye defects, 45 being seriously affected." Galezowski, de Schweinitz, and many others have verified these facts. Nevertheless with improved sanitary arrangements these effects have now disappeared.

Androgué, in a critical analysis of 48 cases of amblyopia from axial neuritis due to nicotine, says the quality of the tobacco is at fault; it was imperfectly dried, which means that the percentage of nicotine in the smoke is much greater than usual.[39]

[Prof. Dixon concluded by referring to what is known of tolerance to the tobacco habit, and analysed the reasons for smoking, and concluded as follows:]

Conclusion.

Tobacco smoking serves as a mild stimulant followed by a slight degree of narcosis, the supersensitive become calm and lose their irritability, and the dull and apathetic are stimulated. The physiological evidence clearly points to this effect, but the explanation has yet to be learned. But smoking leads to digestive and circulatory disturbances. There is an increasing impression amongst clinicians that the insidious action of nicotine spread over many years of continuous absorption is responsible for at least some of the cardiovascular diseases so common in middle and later life.

It may be argued that if nicotine adds to the agreeableness of life, why not use a path so pleasant? In persons of vivid sensations, to calm the commotion of conflicting sensations may be beneficial, even to the higher faculties; in the dull and listless to stimulate thought must be beneficial. It may well be that living in a civilisation such as ours, under the strained conditions imposed by residence in cities, the ordinary man shows in his nervous responses variations from the normal, and on such tobacco exerts a beneficial function. To what extent strict moderation in the use of tobacco leads to vascular degeneration is uncertain: is it the rule or the exception? This is the vital question to which we require an answer, and upon this answer something of the well-being of the nation depends.

In conclusion, I venture to suggest that the collective sagacity of this Society and that of the medical profession as a whole could occupy itself with no subject more important to the nation than that of tobacco smoking.

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A NEW ISOLATION HOSPITAL AT SOUTHPORT.

ON Oct. 14th Sir George Newman, on behalf of the Ministry of Health, opened the new isolation hospital built by the Southport Corporation Health Committee. The new building, which he described as something unique of its kind, replaces two old hospitals: a temporary isolation block in Moss-lane and a small infectious diseases hospital in Shaftesbury-road, now used for tuberculosis. The site of 170 acres was purchased in 1923, but the coal stoppage last year caused delay in completing the building. The hospital stands on the highest part of the land and occupies 12 acres, the rest being let as a farm. There are two scarlet fever blocks with 42 beds, a diphtheria block accommodating 20 patients, and an observation and discharge block. There is also a tuberculosis pavilion (Fig. 1), entirely cut off from the other part of the hospital and divided into two sections, for men and women. Twenty-two patients can be taken here, and outdoor shelters provide eight more beds. It is provided with two recreation-rooms and a common dining-hall, and the whole building is laid out in an up-to-date manner. The floors are covered with wax-polished oak blocks and the wide oak doors are made so that the upper glazed parts can be used as windows and opened in any weather. The usual offices include a special steriliser for sputum mugs.

The fever blocks (Fig. 2), as well as the tuberculosis building, are designed to obtain a maximal amount of sunlight. On the south side of each is a verandah wide enough to take the beds. Each pavilion has two single wards for private patients, and there is a day room in each for convalescents. Other small wards take two or four patients. The observation block has eight single rooms, opening on to a southern verandah. The dividing walls are fitted with large plate-glass panels for observation. Ample and well-segregated sanitary accommodation is provided, and special combination bedpan, bottle, and mackintosh sinks with foot control taps are fitted in each annexe.

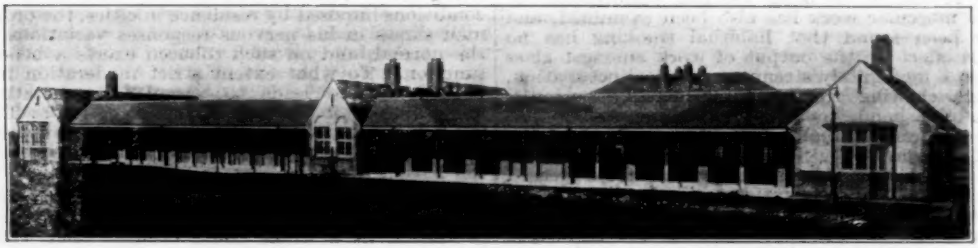
The administrative block contains rooms for the visiting doctor, matron, nurses, and servants, and the kitchen is equipped with electric and steam cooking ranges. Power is supplied from the power block, which contains boiler house, laundry, calorifier house, transformer, and disinfector rooms, garage, and water-softener room. Behind it is a small mortuary with two post-mortem slabs. The sewage is purified on the premises and discharged into a neighbouring brook.

The entire hospital is surrounded with a belt of pine trees and an unclimbable fence. The buildings are all one-floored, of brick and Welsh slates, and the white enamelled walls of the wards are faced with plaster finished in Parian cement. The sanitary annexes and corridors have a white glazed-brick dado up to 4 ft. 6 in., with plaster finish above. The ward windows are of the metal "Austral" type. The duty rooms and wards are warmed with open fires, low-pressure heating system, and electric heating.

The estimated cost of the buildings is £81,000. The staff is to consist of a matron, 4 sisters, 14 nurses, 12 servants, a gardener, an engineer, and an ambulance driver. The three latter have cottages in the grounds.

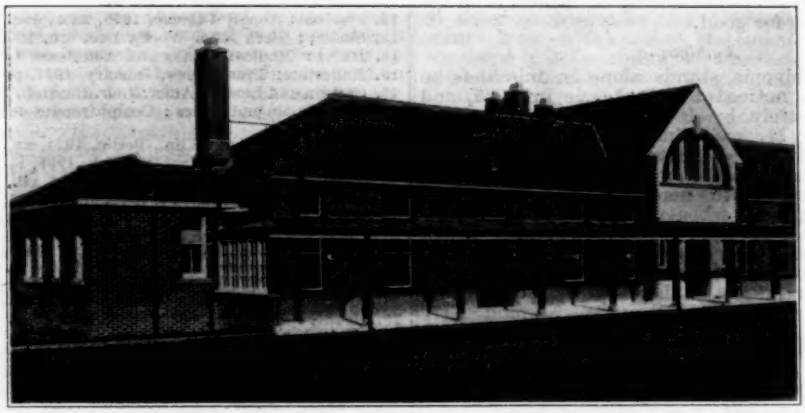
The Health Committee hope soon to add an X ray block.

FIG. 1.



New Hall Isolation Hospital, Southport. The Tuberculosis Pavilion.

FIG. 2.



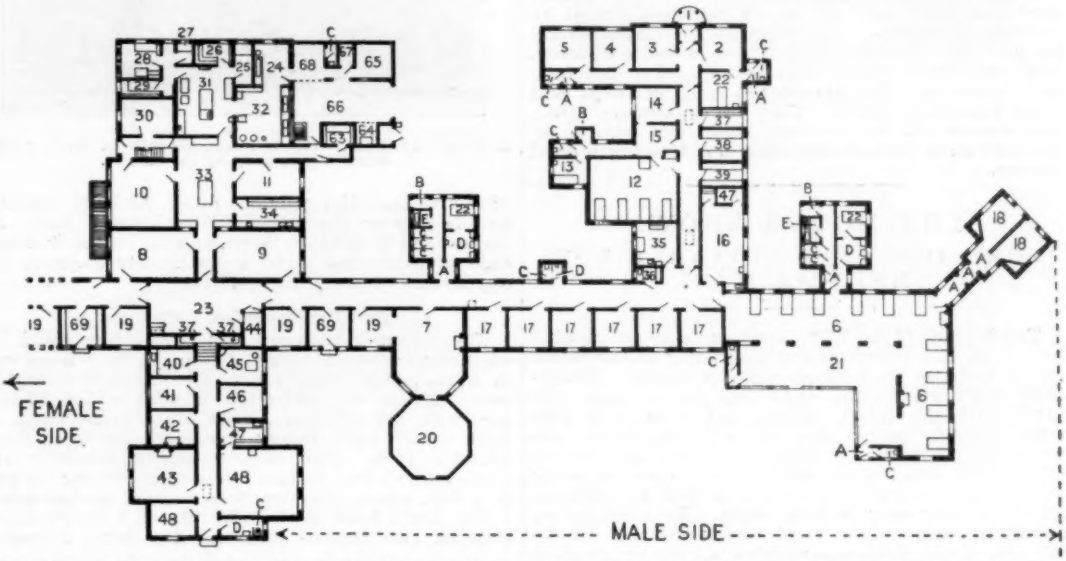
New Hall Isolation Hospital, Southport. Part of the Fever Block.

ST. ANDREW'S HOSPITAL FOR MENTAL DISEASES, NORTHAMPTON.

IN 1804 an anonymous donor presented to the governors of the Northampton Infirmary a sum of £100 "towards carrying on their design of making a provision for persons disordered in their mind." This was the beginning of the "Northampton General Lunatic Asylum," opened in 1838 for 52 pauper and 30 private patients. From 1876 only private patients were received, and the institution became known as the St. Andrew's Hospital for Mental Diseases, now the largest of the 13 registered hospitals of England.

The foundation-stone of a new reception hospital was laid on June 27th, 1924, and the completed building, accommodating 32 patients, was opened on Friday, Oct. 14th, by the Lord Chancellor. In a hospital for patients who have a reasonable prospect of recovery the reception department is, perhaps, the most important of all. In mental disorder the coöperation of the patient is even more essential than in physical disease, and first impressions of an institution may make all the difference between confidence and despair or negativism. In planning their new building the governors have aimed at providing every possible equipment for the treatment of early mental disorder, and at segregating noisy patients. At the opening ceremony Lord Cave expressed a hope that voluntary submission to treatment would soon be extended to county hospitals.

The block stands in its own gardens on a site sloping southwards, and has roughly the shape of the letter E, nearly two-thirds of which are shown in the figure. Along the vertical stroke of the "E" lie single rooms, for men and women, on either side respectively of the central horizontal. Near the middle block are day-rooms, cloak-rooms, and solaria. At each extremity of the vertical are dormitories each with 10 beds and large verandahs opening off them on to which beds can be wheeled. Jutting off from each dormitory is a single two-room suite, trebly isolated by sound-proof doors, where noisy patients can be treated. Bathrooms are provided both off the dormitory and off the corridor linking the single rooms. Each of the upper and lower horizontals of "E" contains admission and examination room, waiting and visitor's room, linen and store cupboards, a massage-room, and a large hydrotherapy hall. The latter contains three prolonged-immersion baths and an electrical bath, and the latest appliances for sprays, needle baths, massage douches, and lavage have been fitted, as well as a Turkish bath. A special room is devoted to various kinds of hot packs, and at the junction of each horizontal with the vertical limb of "E" is a large clinical room where the oculist and rhinologist can do their work, and where such investigations as fractional test-meals, blood examination, and the collection of samples can be carried out. In this room special treatments for focal sepsis are to be given.



Plan of ground floor of hospital. The female side is not shown as it is a replica of the male side. An upper story over the central block contains operating room, laboratories, and staff quarters. (1) Entrance; (2) admission and examination-room; (3) nurses' duty room; (4) waiting-room; (5) visitors' room; (6) dormitory; (7) day room; (8) female dining-room; (9) male dining-room; (10) nurses' mess-room; (11) orderlies' mess-room; (12) hydrotherapy; (13) Plombières; (14) massage; (15) dressing-room; (16) clinic and oculist; (17) single rooms; (18) detached single rooms; (19) sitting-rooms; (20) solarium; (21) verandah; (22) bath-room; (23) main hall; (24) vegetable scullery; (25) pantry; (26) kitchen pantry; (27) milk larder; (28) larder; (29) cooks' store; (30) servants' hall; (31) kitchen; (32) scullery; (33) servery; (34) glass and china; (35) ward kitchen; (36) pack-room; (37) store-room; (38) patients' clothes; (39) linen; (40) dispensary; (41) consulting-room; (42) doctor; (43) medical library; (44) bed lift; (45) dental room; (46) photography; (47) dark room; (48) X rays and electrical treatment; (63) boots and knives; (64) washing shed; (65) coal; (66) yard; (67) wood; (68) covered yard; (69) cloak room. (A) cut off lobby; (B) soiled linen; (C) w.c.; (D) lavatory; (E) housemaids' sink.

In the central horizontal of "E" are the dining-rooms, grouped around a servery which communicates with the kitchens, occupying the free end of the block. An extension of this line across the vertical—i.e., southwards, provides an administration block, with consulting-room for psychotherapy, medical library, and dental room. In this is a special X ray unit for photographing teeth, and a photographic and dark-room adjoin, so that every facility for modern dentistry is at hand. The main electrical departments lie just behind, and are equipped with the latest type of apparatus for diagnosis and treatment, including artificial sunlight, diathermy, and high-frequency installation.

The first floor only extends over the middle horizontal and a little way along the vertical on each side. In the latter part the nurses have their rooms, while the domestic staff are housed above the kitchens. The operating theatre, over the dining-rooms, is connected with the ground floor by a bed lift. Above the administrative block are the two laboratories, one for biochemical work, and the other for bacteriology and pathology. They are designed to work in close coöperation with the clinical rooms, where preliminary and simple investigations are to be carried out.

Specific researches also are to be made; the bacteriological side will begin with special cultural methods, and the biochemical side with the chemistry of the blood.

The whole of this hospital unit is for 32 patients, 16 of each sex. The single rooms in which they are accommodated are about 12 feet square, the feature of squareness giving a sense of increased size and being a pleasant change from the usual oblong shape. The doors of these rooms are all made wide enough for the bed to be wheeled out into the corridor, that the patient may be taken to the examination or treatment rooms, or outside, without getting up. The wards (or dormitories) at the ends of the corridors are broad and roomy, their south walls being formed of large glass folding doors, which give onto the wide verandah.

The furnishing and decoration of the building throughout is very pleasing without being in any way elaborate, and an air of comfort seemed to pervade the rooms. The facilities for hydrotherapy are good, the Plombière's room being a useful addition. Neither skill nor expense has been spared in designing and equipping the laboratories and electrical and other treatment rooms. They are elaborately fitted, and contain all that modern knowledge requires in an institution for investigating and treating mental disease.

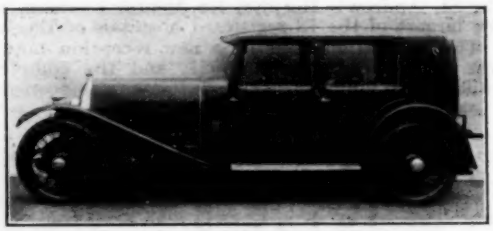
THE MOTOR SHOW.

SOME 1928 CARS SUITABLE FOR MEDICAL MEN.

THE keynote of the 1928 show was, as we anticipated last week, the overwhelming popularity of the fabric saloon body on the light six-cylinder chassis. Practically every maker was exhibiting one or more cars fitted with the fabric saloon, and even open cars were covered, bonnet and all, with this attractive material. Apart from its lightness, fabric has a surface which will stand wear much better than ordinary varnish and almost if not quite as well as cellulose, and it is very easy to keep clean. Its outstanding advantage, however, is its plasticity. Curves can be introduced into the design which could not be executed in a coachbuilt body. The typical fabric saloon at the show is dropped as low as the frame will allow, to give good headroom, with a roof that may not be above the eye-level of a tall man; the running board is also kept low and the wide twin doors, separated by the slenderest of pillars, open a bare six inches above it. A slight vertical as well as horizontal bulge in the sides gives the car the appearance of being adapted to its element like a ship or an aircraft, and the aftermost window on each side, difficult to insert with this type of construction, is replaced by a dummy folding-arm. At the back of the car, beneath the wide rear window, is a spare wheel on a neat bracket, a luggage-grid, and a trunk covered with the same fabric as the body. Some saloons have a roof which folds back like an ordinary hood—a device which for many will remove the last objection to a closed body. Many makers, especially of the lighter cars, fit the Kopalapso roof, made by a firm long famous for easily worked hoods, and the entire roof of the Tickford Sunshine Saloon winds off, on turning a handle, and folds back like an ordinary hood. The Pytchley Automobile Co. make a sliding roof which can be fitted on an existing body. It is generally admitted that the best fabric saloons are made by Gordon England in this country and Weymann in France.

Practically every car this year has a well-planned illuminated dashboard and cubby-hole, shelves or a parcel net, an air strangler for easy starting, and an automatic windscreen-wiper. Saloon windows are nearly all of plate glass with mechanical devices for opening and good blinds, and many cars have an adjustable visor to protect the driver from a setting sun or approaching headlights. Windscreens are now made in one piece, hinged at the top; the joints of the divided pattern hardly ever stood the test of a really stormy day. Other uniform features are four-wheel brakes, shock absorbers, and semi-balloon tyres; most cars have dipping headlights, some have swivelling lamps and fog-lamps pointing to the curb, and practically all have some dimming device. Most speedometers seem to be by Jaeger. The transparent number plate is coming into its own, and the few saloons not covered with fabric

FIG. 1.



A typical 1928 car. The 15·7 h.p. six-cylinder H.E., with a fabric saloon body by the makers.

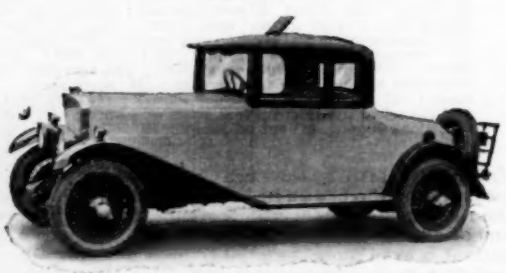
have the beautiful cellulose finish, as hard, smooth, and lasting as the surface of a billiard ball. All bodies tend to be much lower, and the correspondingly high gunwale and wide doors greatly improve the appearance of many models.

Two Representative 1928 Cars.

The triumph of the "six" was illustrated by engines varying in capacity from 1½ to 9 litres and in horse-power from 11 to 45. Most remarkable, however, was the perfection of some of the 16 h.p. cars with six cylinders, listed at a price which in 1921 would have barely purchased an open four-cylinder 11·9. Two cars especially illustrate the way in which the British industry is holding its own in a field where America once reigned unchallenged.

The Arrol-Aster is the offspring of a happy union between two famous veterans, the Arrol Johnston

FIG. 2.



14 h.p. Lea Francis, six-cylinder, with fixed head coupé body.

and the Aster Engineering Co. The 17/50 h.p. chassis would be fair value at £700; actually it costs £460, or £495 with a three-seater body and £535 with a fabric saloon. The first exceptional feature is the Enots "one-shot" chassis lubrication system, by means of which one pump on the dashboard lubricates every bearing in the chassis through pipes. The springs, fitted with silent bloc shackles, need no greasing. The driving position is good, although the gear and brake handles might with advantage be a little closer in and the latter is slightly too near the body for the knuckles to have proper room. The driving-seat is adjustable for rake as well as distance. The windscreen is in one piece, hinged at the top, and has a patent locking device to hold it in place; a drain leads away the water that pours

from the lower edge during a storm, and none can enter the car. The windows of the saloon body spring up by themselves, and the blind over the rear window is controllable from the driver's seat. The tubular cross-member of the frame is hollow, and exhaust gases are led through it to heat the body in winter. Four brakes are worked simultaneously by the foot, and two other independent brakes by hand. The engine has single-sleeve valves and a four-speed gear-box is fitted with right-hand change. Altogether this car is a splendid achievement. These makers, separately and collectively, also manufacture a 14 h.p. four-cylinder and two other six-cylinder chassis.

The Brocklebank 15 h.p. six-cylinder chassis is somewhat smaller. The fabric saloon body, by the makers, is fitted with single seats for the driver and his companion, and the upholstery is of real leather with pneumatic padding. The equipment is lavish and the coachbuilt saloon has one of the best cellulose finishes in the show. No medical man should buy a car of this class without inspecting the Brocklebank. This is the only chassis made by this firm, who believe in concentrating on one design. With a two-seater body the car costs £385, and with a Gordon England fabric saloon £398.

Other medium-powered six-cylinder cars of moderate price, in addition to those we mentioned last week,

FIG. 3.

The Triumph "Super Seven" fabric saloon.

are the 16 Austin, a new-comer which was unfortunately too late for the show (£355), the 18 Bean (£475), the 15 Hampton (£425), the 16 Rover (£410), the 18 Standard (£330), the 18 Star (£450), the 18 Surrey (£325), the 14 Talbot (£395), the 14 Vulcan (£375), the 16 Waverley (£450), and the 16 Wolseley (£450). The price quoted is for the five-seater touring model in each case, but the doctor who prefers a coupé can obtain it on these or practically any other chassis at, usually, a slightly higher price. Morris Motors now sell a light six saloon at £350.

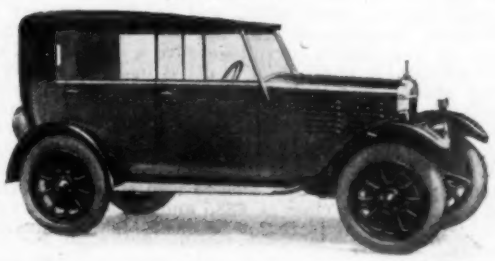
We referred last week to the excellence of the 20 Vauxhall, of which two models are shown at £475 and £495, and of the Armstrong-Siddeley, whose price is remarkably low at £400.

Cheap Cars.

The Trojan at £125 has become a national institution, and the saloon model at £170 is very handsome indeed, though the back seats might with advantage be deeper and have a greater tilt. The top is detachable. The Jowett four-seater (£145) and saloon (£170) have more leg-room than ever, and it is actually possible for a six-foot man to stretch his legs in the back of one of these cars without sitting crosswise. This firm were also showing a most attractive sports model at £145. The "baby" Austin is now sold at £135 and is for the first time faced with a rival, the Triumph Super Seven (Fig. 3), which costs £149 10*s.* as a four-seater, £167 10*s.* as a two-seater de luxe, and £187 10*s.* and £192 10*s.* with fabric and coachbuilt saloons respectively. The back has, if not ample, at any rate reasonable room; the finish and upholstery are of big-car standard, and the makers claim a 55 m.p.h. maximum. Moreover, the design escapes that infantile appearance which the makers of small cars find it so difficult to avoid.

The 9 h.p. Standard at £190 with a two- or four-seater body (Fig. 4), and £215 with a fabric saloon, is a decided acquisition to the small-car class. The most prominent features of this car are its big radiator and the horizontal louvres in the bonnet sides. The top of the windscreen is a little low in the closed model and the central gear lever does not come to hand as

FIG. 4.



The Standard Touring Car.

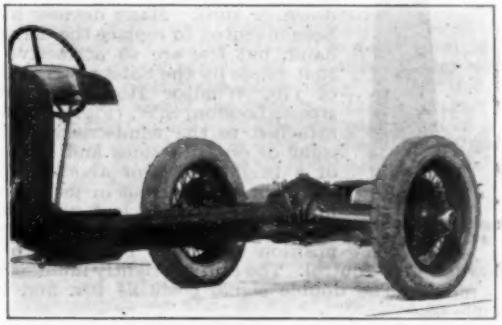
easily as it should, but these are the worst faults. The appearance is very handsome and the body is comfortable to sit in. The passenger preparing to enter the tonneau and fold himself into the small compass usually demanded by such places finds with surprise and relief that the designers have provided a deep pit, extending well under the front seats, in which there is ample room for his feet. The new 9 h.p. Clyno, which has an engine capacity of 950 c.cm., is sold for £145 as a four-seater and £160 as a saloon. It has the new pattern radiator and is an attractive car.

On the borderline of the cheap cars are the Fiat 9 two-seater at £195, the Humber 9/20 two- or four-seater at £250 (a first-class car with plenty of leg-room), the Swift 10 two- or four-seater at £220, the Rover 10 two-seater at £220, and Weymann fabric saloon with sliding top at £250, and the Riley 9 two-seater at £235. This is mentioning a few only out of very many examples.

Foreign Cars.

Study of the catalogue reveals the fact that our industry is now competing effectively with the American and matching it at nearly every point.

FIG. 5.



The new and unorthodox Austro-Daimler chassis.

The Trojan is holding its own, in this country at any rate, with even the redoubtable Ford. Last year the Erskine, a splendid little car, stood quite alone; this year it has more than one British competitor at its chassis price of £230. The new Dodge six-cylinder 25·6 h.p. chassis at £395, or £565 with a saloon or five-seater body, is a new departure for this firm, and the Commander, a Studebaker monster of nearly six litres capacity, or 36 h.p. by our rating,

comes to contest the field with Bentley, Rolls, and Lanchester. It must be admitted that no British saloon of this size is obtainable for £565. The Franklin air-cooled six with its ash frame is still unique, and the Peerless and Velie sixes and the Stearns-Knight and Little Marmon "straight eights" are new to the British market. Size for size, we are increasing our price advantage over the continental manufacturers, but a conspicuous rival in the light six-cylinder class is the 14 h.p. Mathis. This car, with a Weymann fabric saloon, costs £395, and is distinguished by Hypoid transmission gearing, the teeth of which are cut to a special curve to ensure a smooth pull-off. An adjustable cloth visor is fitted inside the body to stop glare. The 10 h.p. Mathis has a conspicuously well-finished Weymann body for £275. Renault, besides the little Monasix, were showing a huge black 45 fabric saloon that they had made to Major H. O. Segrave's order for very fast long-distance touring. Peugeot and Delage also showed "sixes" of 16 h.p. saloon class at £385 and £625 respectively, and Bugatti and Ballot showed new "straight eights."

One of the surprises of the show was a revolutionary chassis on the Austro-Daimler stand called the ADR 22/70 (Fig. 5); from the radiator to the scuttle it is orthodox, but at that point the frame sweeps inwards to meet the unit gear-box, and continues back to the rear axle as a large solid tube encasing the transmission shaft. The live-axle casings are hinged and the rear springs are underneath them. The body is supported at the level of the gear-box and at three points on the tube, once by a stay passing right through this member. The advantages claimed are the saving of 3 cwt., the independent movement of the back wheels, which eliminates skidding and gives better adhesion; exceptionally good springing, a low centre of gravity, and the avoidance of torsional stresses in the body.

There were no new types of large car calling for special notice, but many well-known and excellent makes were fully represented.

Accessories.

Opponents of the saloon body have one argument that cannot be answered, that if the driver is to be protected from weather he cannot signal with his hand. Moreover, no one wants to put an arm out into pouring rain every time he wishes to slow down or turn. Many devices have been invented to replace the driver's hand, but few are so attractive as that made by the Safety Signal Co., of 170, Windsor House, Victoria-street, London, S.W. (Fig. 6). It is attached to the windscreen at the right or on both sides and consists of a bright red arm about a foot long which, when not in use, hangs in a vertical casing and which can be moved to a horizontal or upright position or waved by means of a Bowden-type control. The arm is brightly illuminated by night. The double signal costs £4 10*s.* and the single £3.

FIG. 6.

A safety signal for covered cars.

The well-known Calormeter now incorporates a small glass tube which serves as an indicator of the level in the radiator, and motorists will do well to remember the existence of thermostatic devices designed to regulate their water temperature in winter. The simplest is a radiator muff, the next is a venetian blind shutter with a hand control at the driving seat, a third is the same thing worked automatically by a thermostatic box mounted in the circulatory system (Smith and Sons), and the most elaborate of all is a thermostat that actually controls the flow of water.

A dual windscreen-wiper, clearing two contiguous areas, is an improvement on the single type; in that sold by S. Smith and Sons at £2 5*s.* the two arms are worked from one driving box.

Jacking is facilitated by the provision of the Enots hydraulic jack (45*s.*) of a long handle by which the operator can raise the head to the required height under the axle without circling; also by the Salisbury Jack Guide, a runner fitted under each spring and parallel to it. The jack head, of a special design, is linked on to the runner and pushed along it with the jack handle until it reaches the desired position.

All the well-known makers of sparking plugs exhibited, and Lodges especially catered for particular types of engines, with their HD model for Daimlers, TB for Buicks, AF for Fords at 6*s.* 6*d.*, 5*s.*, and 4*s.* respectively. Dunlops held their own against a new inrush of foreign competitors with their "Buttressed Triple Stud" balloon and medium pressure tyres.

The show was a striking revelation of the enterprise and creative genius of motor-car manufacturers in general and of British makers in particular.

UNITED STATES OF AMERICA.

(FROM AN OCCASIONAL CORRESPONDENT.)

Automobile Accidents.

THE *Vital Statistics Bulletin* of the Pennsylvania State Department of Health, in summarising the morbidity returns for the first half of the present year, remarks that the number of deaths caused by automobiles continues to rise steadily. A table is printed, however, to show that "despite the headline characteristics associated with automobile fatalities there is an encouraging element in the background." For whereas the mortality-rate per 100,000 population has increased from 0·3 in 1906 to 18·4 in 1926, the death-rate per 1000 registered motor vehicles has tended in the opposite direction. This might mean more careful driving or, on the other hand, it might simply indicate that a smaller proportion of the cars are kept on the road than formerly. The present record of one person killed each year for every 800 vehicles registered is shocking enough.

A Public Health Congress.

About 160 speakers have agreed to address the fifty-sixth annual meeting of the American Public Health Association to be held at Cincinnati from Oct. 17th to 21st. Dr. Charles V. Chapin, the President, will speak on Science and Public Health. A discussion on the highly controversial subject, Has Prohibition Promoted Public Health?, will be opened by Prof. C.-E. A. Winslow, of Yale University, and continued by Dr. Louis I. Dublin, statistician of the Metropolitan Life Insurance Company, Prof. Haven Emerson, of Columbia University, and Dr. Matthias Nicoll, jun. The Health Commissioner of the State of New York, Dr. Paul F. Orr, is to give an Epidemiological Study of Malta Fever in Michigan. Among other distinguished speakers is Dr. Frank Boudreau, of the Health Section of the League of Nations, and the meeting promises to be of unusual interest.

New Psychiatric Institute for New York.

Governor Smith, to whose official backing is largely due the successful financing of the new Psychiatric Institute, laid the foundation-stone on Sept. 17th. There will be 20 stories, of which the lower ten will be occupied by a hospital in connexion with the Institute. Here students of the College of Physicians and Surgeons will have an opportunity to study the early symptoms and treatment of mental disease. The upper stories will be largely devoted to research; there will, however, be accommodation in the Institute proper for cases of special scientific interest. Courses of instruction will be offered to physicians, school teachers, social workers, and welfare officers.

Correspondence.

"Audi alteram partem."

THE USE AND MISUSE OF DENTAL SKIAGRAMS.

To the Editor of THE LANCET.

SIR,—Permit me to draw your attention to a practice which appears to be growing and is, I venture to think, prejudicial to all concerned. It is this. A doctor, thinking that the condition of his patient's teeth may have a bearing on his illness, sends him to a radiographer of his own choosing. On the strength of his own or the radiographer's interpretation of the resulting radiograph, often not too clear, he makes a diagnosis, possibly prescribes treatment, and either requires the patient's own dentist to carry it out or very frequently sends him to someone else of his own selection. Surely this is wrong.

Dental radiograms are a very valuable aid to diagnosis, but only an aid, and no substitute for clinical examination. They are often invaluable in revealing unsuspected trouble, more often still in affording ocular and convincing proof of what the dentist already knows or suspects; but, on the other hand, there may be serious sepsis without there being any signs of it in the radiogram; their negative evidence cannot be relied upon. Moreover, to be of value they must be really good, and to produce good dental films requires considerable practice. With certain brilliant exceptions the dentist who takes his own usually attains to a higher level of perfection than the general radiographer. Far too many reports are made upon skiagrams so imperfect that no safe deductions can be drawn from them. Having obtained good films they must be correctly interpreted, often no easy matter, and here again the dentist is more likely to be successful than the medical man or the radiologist in whose report the doctor usually puts implicit faith.

As examples of the gross errors easily made I may mention a case where a patient was recently told by his doctor that an upper wisdom tooth was diseased and must come out, the "tooth" in question being the coronoid process of the mandible; and the frequent condemnation of lower premolars as the subject of apical sepsis, by reason of the proximity of the inferior dental foramen to their roots. It is obviously unwise to depend upon the shadow for diagnosis and entirely ignore the substance. No dentist would rely solely upon radiograms apart from clinical examination and the clinical history. Were he limited to one or the other he would certainly choose a careful clinical examination. It is not uncommon for a patient to come to a dentist with films taken at the request of his doctor and instructions that certain teeth are septic and to be removed, while others much worse have passed unnoticed. It is not only unprofessional and discourteous to ignore the patient's own dentist, but shortsighted; because, if a careful man, he will have a recorded history of the mouth which may prove of the utmost value.

The reasons why he is so often ignored by the doctor when a diagnosis is to be made would appear to be that the doctor mistrusts dentists in general (or, possibly with good reason, that one in particular) while he overrates skiagrams as a source of accurate and complete information, and fails to realise that their interpretation is a matter where the knowledge and experience of the dentist and his clinical findings are of the utmost value, with the assistance of the radiologist in case of difficulty. Surely the correct course is to refer the patient in the first instance to his own dentist, if he has one, for a report, with skiagrams, of the condition of the mouth. If, for any reason, this report should not inspire confidence, a second opinion should be sought. In this way the patient's best interests would be served and no one would have cause to complain. The facts are that the average doctor has very little knowledge of teeth, and the average dentist has very little knowledge of general pathology, so that only by their close coöperation can the patient derive the maximum benefit.

I am, Sir, yours faithfully,

Harley-street, W., Oct. 12th, 1927. J. H. BADCOCK.

PARAPLEGIA IN HODGKIN'S DISEASE.

To the Editor of THE LANCET.

SIR,—In connexion with the three articles in THE LANCET of Oct. 15th (pp. 806–810), perhaps I may be permitted to draw attention to a case of Hodgkin's Disease with Paraplegia, by Dr. J. Carslaw and Dr. J. S. Young, in the current number of the *Glasgow Medical Journal* (1927, cviii., 193). In their case there was a diffuse growth of fibrocellular tissue, comprising a small proportion of large cells with irregular, hyperchromatic nuclei, in the extradural space of the dorsal region.

As far as I know no involvement of the extradural space has yet been noted in cases of Hodgkin's disease in which during life there has been herpes zoster, but perhaps this is because in such cases the vertebral canal has not been examined at post-mortem examinations. Personally, I used to think that the occurrence of herpes zoster in cases of Hodgkin's disease was due to arsenical treatment, but it may well be that in some cases it has been a result of involvement of the posterior roots (with their ganglia) of spinal nerves in the lymphogranulomatous process. Incidentally I note that these authors speak of "Hodgkin's sarcoma" after J. Ewing. Surely, the term "Hodgkin sarcoma" would be better, as Hodgkin certainly did not distinguish a Hodgkin sarcoma from a Hodgkin granuloma, though now both may well be named after him (in his honour).

I am, Sir, yours faithfully,

London, W. 1, Oct. 15th, 1927. F. PARKES WEBER.

SUBSTITUTES FOR WINDOW GLASS.

To the Editor of THE LANCET.

SIR,—I have read with great interest the comment in THE LANCET of August 6th, p. 316, on the report of the Council on Physical Therapy of the American Medical Association on various materials advertised as pervious to ultra-violet rays. Your coöperation and support as evidenced by the publicity given this report and previous reports of the Council in your valued journal is deeply appreciated. Such coöperation and support of the Council in its great task will materially hasten the day when physical therapy will be on as sound a basis as pharmacotherapy is to-day.

In view of the undoubtedly good influence of such publicity it is unfortunate that in the comment on the report on window glass substitutes the writer should apparently not thoroughly understand the purposes of some of the experimental work that was done by the Council. In the last paragraph of your article it is stated that in view of the well-established fact that it is the shortest ultra-violet rays of sunlight that make heliotherapy valuable in the prophylaxis and cure of rickets, it seems hardly necessary to have tested the value of these glass substitutes biologically. The object of the biologic test performed on the materials under consideration has been apparently understood imperfectly.

The object of the biologic test was threefold: (1) to determine whether sufficient ultra-violet energy is present in winter sunshine in urban centres to warrant the use of materials of this sort for glazing windows; (2) to determine the relative value of the materials tested as transmitters of the anti-rachitic rays of the sun; and (3) to determine the antirachitic effect of winter sunlight filtered through these materials as compared with that of ultra-violet light from an artificial source.

I am, Sir, yours faithfully,

H. J. HOLMQUEST,

Chicago, Oct. 6th. Secretary, Council on Physical Therapy.

THE POSITION OF MEMBERS OF THE ROYAL COLLEGE OF SURGEONS OF ENGLAND

To the Editor of THE LANCET.

SIR,—The Council of the Royal College of Surgeons of England has just published the result of the poll of the Fellows of the College on the question of the admission of Members to some representation on the Council. The voting paper was sent to 1850 Fellows; 846 voted No, 234 voted Yes; 770 Fellows did not vote. Unfortunately, and unfairly, I contend, the Council issued with the voting paper a definitely biased and *ex parte* statement of the Members' case.

It is remarkable that 770 Fellows did not vote. Also it should be noted that there are about 600 Fellows in the metropolitan area.

I am, Sir, yours faithfully,
REDMOND ROCHE.

Eccleston-square, S.W., Oct. 16th, 1927.

HOSPITALS AND MOTOR-CAR ACCIDENTS.

To the Editor of THE LANCET.

SIR,—May I trespass upon your columns to ask the secretaries of hospitals throughout the country who can provide statistics as to the number of motor-car accident cases treated (with, if obtainable, the average length of stay) to send them to me, if possible, by the end of the present month. I am endeavouring to obtain statistical proof of the circumstances which have been alluded to so frequently in your columns of late.—I am, Sir, yours faithfully,

H. W. BURLEIGH,
Secretary and General Superintendent.

Hospital for Epilepsy and Paralysis, Maida Vale, W.,
Oct. 17th, 1927.

MISLEADING QUALIFICATIONS.

To the Editor of THE LANCET.

SIR,—By an old-standing convention (adopted by makers of dictionaries and works of reference) Fellowship of the Royal College of Surgeons of England is denoted by the letters F.R.C.S., and Fellowship of the Royal College of Physicians of London by the letters F.R.C.P. Fellowship of other colleges, according to the same custom or convention, should be indicated by the addition of letters distinctive of the college to which the Fellow belongs. Those who do not conform to this convention are therefore liable to be judged ignorant if not, indeed, anxious to appear other than what they are.

But there is no existent convention by virtue of which any one who appends M.D. to his name is to be supposed doctor of medicine of any particular university. M.D. means doctor of medicine; F.R.C.S. means Fellow of the Royal College of Surgeons of England. I am, Sir, yours faithfully,

Oct. 14th, 1927. F.R.C.P.

*** More authority is needed for the closing "ipse dixit."—ED. L.

PAYMENT TO HOSPITALS FOR MOTOR ACCIDENTS.—Motor accidents are causing a serious increase of the waiting list at the Norfolk and Norwich Hospital, besides heavy expenditure. Motor insurance companies, it is stated, have resisted liability for payment of the hospital costs of such accidents on the ground that hospitals are voluntary institutions, and are therefore unable to sustain a claim. A report shows that in the first week of September there were 35 cases of injury in motor accidents in the hospital, and that their length of stay was considerably above the average. At a meeting of the hospital authorities on Oct. 8th it was pointed out that a private practitioner to whose surgery a motoring victim was taken could send his bill to the insurance company, and that the hospital could put itself in the same position as a private practitioner by sending all its motor cases to the new paying ward which would be opened early in the new year.

Obituary.

MAJ.-GEN. SIR WILLIAM GRANT MACPHERSON, K.C.M.G., C.B., LATE A.M.S.

WE regret to announce the death of Sir William Macpherson, the editor-in-chief of the official "Medical History of the War," and a familiar person to medical men as a great soldier-doctor. He died on Saturday last at his house in Evelyn Gardens, Kensington, at the age of 69.

Macpherson was the son of the Rev. W. Macpherson, of Kilmuir Easter, Ross-shire, where he was born in 1858. He was educated at Fettes College, being one of the original band with whom that school was opened in 1870. He proceeded to the University of Edinburgh, where he graduated in the first instance in high classical honours, being university scholar in Greek, but later he turned to medicine, and in 1882 graduated M.B., C.M. Edin. After taking out post-graduate courses at the Universities of Leipzig and Tübingen, he entered the Royal Army Medical Corps with credentials of an unusually high order, so that his success was immediately predicted and opportunities for special service came readily to his hand. In 1892 he was in medical charge of Sir Euan Smith's mission to Fez, and he filled the same position in Sir Arthur Nicolson's mission to Morocco City. In such capacities he made a mark for himself alike as a doctor and as a man of the world, and previous to the outbreak of the European War his career formed a series of special duties in South Africa, Panama, and Cuba, while in 1904, having received the C.M.G., he was appointed senior medical officer to the North China Command. This post he was permitted to select for himself in response to a flattering suggestion that he should go where he could be most useful. He chose the China appointment because it would bring him near the scene of the impending struggle between Russia and Japan, with the result that he was attached during the Russo-Japanese War to the Japanese Army in the field, saw a great variety of service, while his personal work was recognised by two Japanese decorations. The experience gained in these several ways on all sides of medical organisation was used by him immediately afterwards in Geneva, where he was one of the British plenipotentiaries at a conference for the revision of the Geneva Convention, and in 1906, and for the next four years, he was attached to the general staff A.M.S. In 1910 he was appointed P.M.O. at Malta, and after holding this position for one year he was transferred for three years to the

SIR WILLIAM MACPHERSON.

Staff College at Quetta, an appointment which he was holding previous to the outbreak of the European War.

The beginning of hostilities found him in high position at the War Office, and it became his duty to coöperate with Sir Alfred Keogh in improvising immediately the medical activities of our Army, and this on an unparalleled scale of magnitude as the numbers of the troops grew with bewildering rapidity and the areas of fighting were multiplied. The official history of the war, for which Macpherson afterwards became responsible as editor-in-chief, shows how wide and various was his own personal share in the many and critical circumstances where the prompt availability of medical measures formed an essential feature in the conduct of the war. As Director of Medical Services in the First Army, as Deputy Director-General, and later as Director of Medical Services to the British Forces in Macedonia, he acquitted himself with the highest distinction, being mentioned in dispatches nine times and receiving the C.B. in 1915 and the K.C.M.G. in 1918. But he will be remembered especially for his fine accomplishment in compiling and freely contributing to the "Medical History of the Great War," and organising its issue in an authoritative and convenient form. Deliberately limited, under Treasury conditions, to 12 volumes, this history forms a record, as far as possible in narrative form, of the chief features in the medical services of the United Kingdom, in garrisons overseas, and with the Expeditionary Forces in the various theatres of war during the years 1914–18, and in subsequent periods when connected incidents occurred of historic interest or importance. Our readers know the care exercised by the editor-in-chief and his collaborators both in the selection of material and the proportionate space of the various chapters, for the work, as it appeared, has been freely reviewed in these columns. It is sufficient to say that the object of the History, as stated in Macpherson's general preface, was well carried out within the necessary limitations; a consecutive medical story of the war was presented in an accessible form, for which the obvious sources of information have been drawn upon, while much material buried in masses of war diaries, administrative files, and official documents has been included, verified, and collated, so that its significance emerges in relation to the general narrative.

The time and leisure which Macpherson obtained by retirement from the Army, when not taken up by his official literary labours, were amply filled with public work. He rendered active assistance to the British Medical Association, being for five years a representative on the Council of the R.A.M.C., for six years a member of the Naval and Military Committee, a member of the Committee on the Expansion of the Royal Army Medical Services in cases of national emergency (1921–23), of the Committee on the Royal Commission on the Superior Civil Service in India (1924–26), and chairman of the Special Committee on Tests for Drunkenness. Further, to the editorial work of the *British Medical Journal* he rendered valuable help as a writer and reviewer. For his pen was as skilled as his knowledge was wide, and THE LANCET was also on many occasions indebted to Macpherson for help and advice.

Personally, Macpherson was a striking example of a charming man, to use a hard-worked epithet, while the slightest acquaintance with him revealed that an attractive manner was the least of his gifts. His real learning and his hard experiences had left him extraordinarily modest, but his capacity was there to be used when needed. Always courteous and sympathetic, he endeared himself to a large circle of friends outside official and professional relations; he was a genial host and a versatile athlete. As an undergraduate he had been a distinguished boxer and gymnast; he played polo and hunted and raced at the various stations to which responsible duties called him, and later in life he became a keen golfer. In this connexion his gratification was great when the R.A.M.C. won the Army Championship Cup at St. Andrews last year. A series of honours fell to him in the natural course of events in addition to those we have already mentioned. He was a Companion of the Legion of Honour and of the Crown of Italy, received the Distinguished Service Medal of the U.S.A., and the University of Edinburgh made him an LL.D. in recognition alike of his distinction as a scholar and of his national work.

Macpherson was married first to Miss E. A. Clunas, daughter of Mr. J. Clunas, of New Orleans, who died in 1907, and three years later he married Miss G. E. Doran, daughter of General Sir John Doran.

WILLIAM CAMERON MACAULAY, M.B. LOND.

Dr. Cameron Macaulay was the second son of Bryce Johnston Macaulay, headmaster of Wishaw Public School, Lanarkshire, and was born in 1869. Educated at Wilson Grammar School, Camberwell, he was obliged by straitened family circumstances to begin earning his livelihood at the early age of 17. He became a teacher, held various masterships, and in 1895 he graduated as Bachelor of Arts in the University of London with honours in English. For another three years he remained in the teaching profession, being an assistant master at the Westminster City School and tutor in early and mediæval English for the examinations of the University of London. But in 1898, at the age of 30, he entered the Middlesex Hospital as first entrance scholar, and began a brilliant career as medical student. He secured almost every scholarship and prize; thus in one year, 1904, he won the John Murray gold medal and scholarship, the second Broderip scholarship, the Governor's prize, the Leopold Hudson prize, and the Hetley Clinical prize. In the intervals of strenuous medical study he found time to continue teaching in English, and for several years also he held the post of demonstrator of chemistry at the Hospital Medical School. In 1903 he graduated as M.B. Lond., and after holding the resident obstetric appointment at the Middlesex settled down in practice at Brixton, where he worked until within a month of his death, save for the period of the war. An ardent Territorial, he was second in command of the 2/5th London Field Ambulance from its formation to its disbandment. He saw active service in France, Salonika, Macedonia, Egypt, Palestine, and Syria, and was mentioned in dispatches by General Allenby for gallant and distinguished services in the field.

Mr. G. Gordon-Taylor, to whom we are indebted for these biographical details, writes as follows of Dr. Macaulay's work as a practitioner: "Circumstances prevented him from taking up consulting work, and his brilliant academic career was therefore not crowned by a staff appointment, but he faithfully, ably, and assiduously served his patients in the south of London. He had a dignified and impressive appearance, and although the Latin word *gravitas* is perhaps most descriptive of him, to use the words of the younger Pliny it might well be said of Cameron Macaulay: *Et dignitate personæ et exempli raritate et iudicii magnitudine insignis.*"

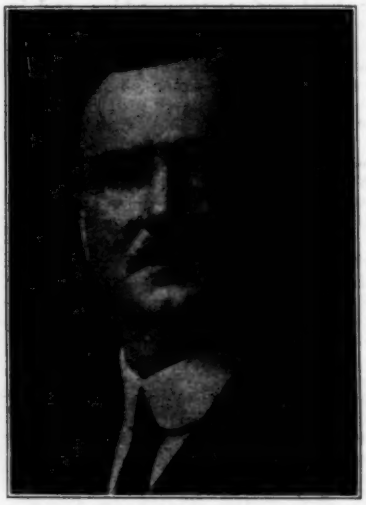
Mr. Victor Bonney writes: "Dr. Macaulay's premature death is a real loss to the profession. He entered his calling late, so that though a student under me, he was considerably older than the rest of his classmates. He was a very brilliant man and possessed ability which would have fitted him for any position, however high. As too often happens to men of the greatest promise, circumstances compelled him to take up a line of work where his great gifts were hidden from the recognition of the general public. That he did splendid though unostentatious work I can vouch for, and his noble and steadfast character enabled him to meet the tragic fate that befell him with extraordinary courage and fortitude."

Dr. Macaulay's final illness was treated at his old hospital where he was surrounded and looked after by his old friends and class-fellows, commanding the

admiration and respect of all who worked to try to save him. He is survived by a widow and one son, Dr. H. M. Cameron Macaulay, who is deputy county medical officer of health for Middlesex.

SIR JOHN O'CONOR, K.B.E., M.D., B.CH. DUB.

John O'Conor was born at Carrick-on-Shannon in 1863, the son of Mr. Abraham O'Conor of that place, and received his medical education at Armagh and Trinity College, Dublin, where he was a member of the Fifteen and stroke of the Eight. He graduated in medicine in 1886, proceeding to the doctorate in 1890, and was for three years resident surgeon at the Royal Hospital, Portsmouth, but in 1890 proceeded to Buenos Aires, having been appointed one of the resident medical officers at the British Hospital. Four years later he became senior medical officer, and from that institution have emanated the many communications on surgery, dietetics, and hospital administration which he made to the medical press. These communications were largely in the form of letters, in which particular points were taken up or brief summaries were given of personal experience along certain ranges of diagnosis and treatment, although longer articles were occasionally published from his pen, such as a recent one in our columns upon cholelithiasis. Much of his writing was of practical value, and if his communications suffered in one respect from the desultory nature of their appearance, this method at any rate enabled him more than occasionally to give topical advice upon many varying problems. He was created K.B.E. in 1920, when he was chairman of the British Patriotic Administration Committee, and many without as well as within his profession know how zealously he worked.



SIR JOHN O'CONOR.

Sir John O'Conor married Grace Beatrice Richmond, daughter of Mr. James Oxley, of Frome, and she survives him with two daughters and a son who is a lieut.-commander in the Navy. Of two other sons, one died in infancy and the other on service during the late war.

ARTHUR JOHNSON GEDGE, M.R.C.S. ENG.

Dr. A. J. Gedge, whose death occurred at Havant, in Hampshire, on August 15th, was born 63 years ago, and was the son of the Rev. John Denny Gedge, vicar of Mildenhall and Methwold. He received his medical education at the London Hospital, where, after qualifying as L.S.A. in 1886, he held the appointments of house physician, house surgeon, and resident accoucheur. Having acquired further experience as house surgeon at the Eccles and Patricroft Hospital and on board the *Clulow*, one of the hospital ships belonging to the Mission to Deep Sea Fishermen, he settled in practice at Baldock in Hertfordshire, but 24 years ago moved to Havant, where the remainder of his life was to be spent. Dr. Gedge strongly advocated abstention from alcohol and was medical officer to the local Tent of Rechabites. He was a faithful churchman; a number of his patients and friends are arranging to place a window to his memory in the Parish Church, Havant. He will be much missed in local archæological circles for his sound antiquarian knowledge, which was always at the service of the Hayling Island Field Club. It was largely due to his private representations and to an appeal which he drafted that Portchester Castle was scheduled as an historic monument and saved from further dilapidation, and he was keenly interested in the excavation of the newly discovered Roman villa on Holt Down, between Horndean and Petersfield.

"It has been one of the greatest privileges of my life," writes a medical colleague, "to know Arthur Johnson Gedge for 20 years. During that period I never heard him say an unkind word of anybody. His tastes were numerous. Archæology, antiques, folklore, and country life being perhaps the principal things in which he interested himself apart from his professional reading, which had been wide and varied. His keen sense of professional honour was such that all his colleagues trusted him perfectly. He was consistently cheerful during a lifetime of many difficulties (never referred to by himself); his patients loved and trusted him absolutely, and he has left behind him a fragrant and beautiful memory."

Dr. Gedge left a widow, two sons and one daughter

Medical News.

UNIVERSITY OF CAMBRIDGE.—At a Congregation held on Oct. 15th the following degrees were conferred:—

M.D.—J. C. N. Harris (by proxy) and L. P. Lockhart.

M.B. and B.Chir.—H. J. Burrows, N. H. R. Hatfield, G. P. Chandler, and M. S. Dewhurst.

M.B.—A. C. Copley.

At recent examinations the following candidates were successful:—

Diplomas in Public Health and in Hygiene.—Part II.: L. A. P. Anderson, H. M. Ayres, Albert Gilbert, H. M. Osman, M. H. M. Ragab, K. N. Segal, George Shehata, H. Singh, Mary Y. M. Stevenson, and H. C. Wilkinson.

UNIVERSITY OF GLASGOW.—The following degrees were conferred on Oct. 17th:—

D.Sc.—John Glaister, M.D.

M.D.—With honours: Amy M. Fleming and Georgina Murdoch. *Ordinary Degree:* A. M. Scott.

M.B., Ch.B.—With Honours: W. A. Mackey, Margaret W. Thomas, W. S. Hodghton, A. K. Hill, and J. M'K. Brewster. *With Commendation:* A. W. Fraser, Matthew Bowman, Margaret G. Crockett, G. H. Gibson, L. J. Lang, Robert M'Whirter, W. B. Kyles, John Fleming, Thomas Johnstone, S. A. Maclean, H. P. Goldman, and L. L. Hurwich. *Ordinary Degree:* F. V. Adams, James Agnew, R. W. Agnew, Frances W. Anderson, W. W. Ballardie, Hugh Bankhead, John Baxter, George Bryden, R. MacN. Buchanan, J. S. G. Burnett, J. B. Cadas, J. M. Clow, Thomas Craig, Isabella M. Currie, John Darling, H. M. Davie, I. M'C. C. Dewar, J. S. Drummond, J. E. Dunn, L. C. Durie, C. A. Ferguson, H. R. Ferguson, J. B. Fulton, R. D. Gilchrist, J. M'M. Gilston, J. S. Graham, J. C. Gunn, Thomas Hamilton, Daniel Hannah, Alexander Hart, J. A. Houston, William Hunter, Philip Jacobs, Robert Jamieson, R. S. Kennedy, W. M. F. Ker, G. K. Kirkland, William Kirkwood, Annie Laird, Malur Lakshmiamma, J. H. B. Livingston, Alexander M'Crorie, Allan Macdonald, James MacDonald, William MacDonald, C. M. M'Intyre, Charles M'Kay, J. L. M'Neill, H. D. Manderson, A. C. Morrison, Margaret Mulvein, Jessie W. Ogilvie, R. A. S. Peacock, Elizabeth M. Pollock, T. A. Pratt, A. R. Reid, J. B. Rennie, Daniel Robertson, J. K. Roger, B. B. Rosenheim, W. F. Sellar, A. R. Shaw, James Simpson, H. S. Strachan, W. B. Sutherland, George Swanson, Jean W. Symington, Annie R. Thompson, T. H. S. Tizzard, Matthew Tytler, Isabella B. Wiese, W. H. Wilkie, A. D. Williamson, Elizabeth R. M. Wilson, J. W. Wilson, W. G. Wilson, and Elizabeth N. Young.

William A. Mackey gains the Brunton Memorial Prize awarded to the most distinguished Graduate in Medicine of 1927.

Margaret W. Thomas gains the West of Scotland R.A.M.C. Memorial Prize, awarded to the candidate with the highest aggregate marks in Medicine, Surgery, and Midwifery in the Final M.B., Ch.B. Examination, 1927.

ST. THOMAS'S HOSPITAL DINNER.—The old students' dinner will be held at St. Thomas's House, Lambeth Palace-road, on Friday next, Oct. 28th, at 7.30 for 8 P.M., Sir Charles Ballance in the chair.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—At a quarterly meeting of the Council on Oct. 13th, Sir Berkeley Moynihan, the President, in the chair, it was reported that the vacancy in the Council occasioned by the death of Mr. Thelwall Thomas would be filled at the election of members of Council in July next. The President further reported that a Sir Gilbert Blane gold medal had been awarded to Surgeon-Lieut. Commander Allan Watt McRorie, M.B., R.N.—Mr. C. J. S. Thompson, M.B.E., formerly director of the Wellcome Historical Medical Museum, was asked to act as honorary curator of the historical section of the museum (including surgical instruments and appliances), in succession to the late Mr. Alban Doran, F.R.C.S., for the ensuing year.

The result of the recent poll of the Fellows about altering the constitution of the College was announced as follows: The question asked was, "In your opinion is it desirable that members of the College should have direct representation upon the Council?" The voting was, "No," 846; "Yes," 234; majority against, 612.

The annual report of the Council, 1927, was approved and adopted, and will be placed before the Fellows and Members at the annual meeting on Thursday, Nov. 17th.—The President reported that Sir Holburt Waring had consented to deliver the next Hunterian oration, and it was decided to celebrate the bicentenary of the birth of John Hunter on Feb. 14th, 1928, either by bringing forward by one year the usual Hunterian festival, or in some other manner.

The under-mentioned diplomas were conferred by the Council:—

F.R.C.S.—Nils L. B. V. Eckhoff, M.R.C.S., L.R.C.P., Cape and Guys.

M.R.C.S.—G. M. Phadke, University College.

L.D.S.—M. Abrahamson, Middlesex and Royal Dental Hosps.

The *Thomas Vicary Lecture* will be delivered in the theatre of the College on Thursday, Nov. 3rd, at 5 P.M., by Dr. George Parker, whose subject will be the Early Development of Hospitals.—The *Bradshaw Lecture* will be delivered on Thursday, Nov. 10th, at the same place and hour by Sir Cuthbert Wallace. It is entitled Enlarged Prostate: A Review. Members of the profession who are not Members or Fellows of the College will be admitted to these lectures on presentation of their private visiting cards.

ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH, ROYAL COLLEGE OF SURGEONS OF EDINBURGH, AND ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW.—At examinations held recently the following candidates were granted the diploma in Public Health:—

Hassan Suhrawardy, William B. Moore, Angus E. W. McLachlan, James O. Hamilton, Jeannie Kean, Charles K. Robertson, John Douglas, Andrew McFarlane, and Archibald Gardiner.

The following candidate passed Part I.:—

Eleanor B. Bone.

THE Prix Hollandais, awarded for the best work of the year in physical anthropology, has gone to Miss Dorothy A. E. Garrod, whose volume on the Later Palæolithic Age in Britain was published in 1926 by the Clarendon Press. The prize is of the value of 7000 French francs, say £57.

UNIVERSITY COLLEGE HOSPITAL DINNER.—The annual dinner of past and present students was held at the Hotel Cecil on Oct. 14th, when Sir George Blacker presided over a large gathering. In the course of his report on the past year, the Dean, Dr. A. M. H. Gray, mentioned that the centenary of the medical faculty of University College fell in 1928. He said that, with its new obstetric and aural hospitals, University College Hospital now possessed 500 beds, and in buildings and equipment was second to no hospital in London. Among the investigations carried out in the medical school during the past year he mentioned the synthesis of thyroxin by Dr. C. R. Harington, a notable achievement in biochemistry. He also referred to the severe loss which the hospital had recently sustained in the deaths of its chairman and vice-chairman, Sir Ernest Hatch and Lord Oranmore and Browne.

ROYAL ACADEMY OF MEDICINE IN IRELAND.—The annual meeting was held on Oct. 14th, Sir William Taylor was elected President in succession to Sir James Craig, whose term of office had expired. Sir William Taylor is Regius Professor of Surgery in the University of Dublin, and is one of the surgeons to Sir Patrick Dun's Hospital; he has been a Fellow of the Academy since 1898. The following were elected on the General Council: Sir James Craig, Mr. R. C. B. Maunsell, Sir John Moore, Dr. T. G. Moorhead, Dr. G. E. Nesbitt, and Prof. R. J. Rowlette. The following were elected presidents of the several sections: Medicine, Dr. G. E. Nesbitt; surgery, Mr. Andrew Fullerton; pathology, Mr. T. T. O'Farrell; obstetrics and gynæcology, Dr. G. FitzGibbon; anatomy and physiology, Dr. J. M. O'Connor; State medicine, Dr. J. W. Bigger.

UNIVERSITY OF LONDON: *University College Hospital.*—Three lectures on the History of Medicine (illustrated by lantern slides) will be delivered by Dr. Charles Singer on Mondays, Nov. 7th, 14th, and 21st, at 4.15 P.M., in the large lecture theatre No. 1, of the Medical School. The subjects will be respectively Syphilis, Influenza, and Typhoid Fever, and the lectures will be open to all medical students of the University.

UNIVERSITY OF OXFORD.—The new School of Biochemistry will be opened to-day (Friday), Oct. 21st, by Viscount Cave, Lord Chancellor of England and Chancellor of the University. The ceremony will be held in the Sheldonian Theatre at 3.30 P.M., after which, at about 4 P.M., the Chancellor will proceed to the new department which will be opened for inspection.

BROADCASTING AND PUBLIC HEALTH.—On Oct. 5th Dr. G. F. Buchan, ex-president of the Society of Medical Officers of Health, broadcasted an address from 2 LO on Health and Education. This is said to be the first time that a medical officer of health has broadcasted in this country.

INTERNATIONAL OTO-RHINO-LARYNGOLOGICAL CONGRESS.—The provisional programme has now been issued of this Congress to be held at Copenhagen from July 29th to August 1st, 1928, under the presidency of Prof. E. Schmiegelow. The Secretary-General is Dr. N. R. Blecvad, 3 Nytorv, Copenhagen, K.

AN ASTHMA RESEARCH COUNCIL.—A new organisation has been formed called the Asthma Research Council. The Earl of Limerick and Lord Greenway are to act as president and vice-president respectively, and the honorary secretary is Capt. F. L. M. Boothby. The offices are at 12, Bedford-street, Strand, London, and the Council is stated to be "anxious to get in touch with all asthma sufferers."

UNIVERSITY OF MANCHESTER.—Dr. R. B. Wild, who has recently retired from the Leech Chair of Materia Medica and Therapeutics, has made a gift of £250 for the endowment of a prize in pharmacology. Prof. J. S. B. Stopford has been appointed as representative of the University on the General Medical Council; Mr. C. A. McGaughey, M.R.C.V.S., has been appointed assistant lecturer and Dr. E. St. G. Gilmore demonstrator in bacteriology; and Dr. H. C. Sheehan has been appointed demonstrator in pathology.

DONATIONS AND BEQUESTS.—The late Baroness Marie von Schröder, of The Rookery, Worleston, Nantwich, left £500 each to the Nantwich Cottage Hospital and the Crewe Cottage Hospital—Mr. Joshua Fearnside Sinclair, of Otley, solicitor, left £500 to the Otley and District Nurses' Home, £300 to the Otley Ladies' Sick Nursing Visiting Society, and £1000 to the National Children's Home and Orphanage.—Mr. C. Collins, of Edgbaston, left the whole of his property, £13,963, to his wife for life, and on her death, after several legacies, the residue between the General Hospital, Queen's Hospital, Children's Hospital, General Dispensary, Women's Hospital, and the Eye Hospital, Birmingham, and the Blind Asylum, Edgbaston.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION.—On Monday, Oct. 24th, at 5 P.M., at the rooms of the Medical Society of London, 11, Chandos-street, Cavendish-square, Mr. Herbert Paterson will deliver a lecture entitled Surgical Hints. On the same afternoon, at 2 P.M., Mr. J. B. Hunter will give a surgical clinical demonstration at the Royal Northern Hospital, and on Tuesday, the 25th, at 3 P.M., there will be a medical clinical demonstration at the same hospital, by Dr. Bruce Williamson. At the Central London Ophthalmic Hospital, on Thursday, Oct. 27th, at 4 P.M., Mr. Cunningham will give an ophthalmic clinical demonstration. The lecture and the demonstrations will be open to members of the medical profession without fee. From Oct. 24th to Nov. 5th, there will be a special course in ophthalmology at the Royal Eye Hospital, with demonstrations daily at 3 P.M. Courses in the following subjects will be given during November: Medicine, Surgery, and the Specialties, at the Hampstead General Hospital, 4 to 6.30 P.M., Oct. 31st to Nov. 12th; a similar course at the London Temperance Hospital, Nov. 21st to Dec. 3rd; Medicine, Surgery, and Gynæcology at the Royal Waterloo Hospital, afternoons and some mornings, Nov. 14th to Dec. 3rd; Diseases of the Chest at the Brompton Hospital, all day, Nov. 7th to 12th; Neurology, at the West End Hospital for Nervous Diseases, Nov. 21st to Dec. 17th, daily at 5 P.M.; Proctology at St. Mark's Hospital, Nov. 28th to Dec. 3rd; Urology at St. Peter's Hospital, afternoons, Nov. 14th to 26th; and Venereal Diseases, at the London Lock Hospital, afternoons and some evenings, Oct. 31st to Nov. 26th. Copies of all syllabuses are obtainable from the secretary of the Fellowship at 1, Wimpole-street, London, W.

Dr. Joseph Priestley, on his retirement after 32 years' service as medical officer of health for Lambeth, is to receive a presentation from fellow practitioners of the locality. The ceremony will take place on Thursday, Oct. 27th, at the town hall.

HANBURY MEMORIAL MEDAL.—The gold medal from time to time awarded in memory of Daniel Hanbury for "high excellence in the prosecution or promotion of original research in the Chemistry or Natural History of Drugs" has been given this year to Mr. T. A. Henry, D.Sc., Director of the Wellcome Chemical Research Laboratories, London. Since 1881 there have been 21 recipients of the medal, seven of whom were British and six German. The trustees of the fund are the Council of the Pharmaceutical Society of Great Britain.

PURITY OF ICE-CREAM.—A deputation representing the Ice-Cream Association of Great Britain and Ireland waited on officials of the Ministry of Health on Oct. 11th and suggested that a legal definition of ice-cream should be laid down—namely, "a frozen product containing not less than 8 per cent. milk-fat and not less than 10 per cent. milk solids not fat." It was proposed that all manufacturers and vendors of ice-cream should be licensed by local authorities who should inspect their premises. The view of the association is said to be that those who want to sell a frozen confection which contains no cream should be compelled to use some description not containing the word "cream."

SURGICAL INSTRUMENT MANUFACTURERS' ASSOCIATION.—The annual dinner of this Association was held at the Holborn Restaurant on Oct. 14th, under the presidency of Mr. E. W. Mayer. The guests included Sir John Corcoran, Mr. Cecil Rowntree, F.R.C.S., and Mr. L. Ferris-Scott. Mr. Patrick C. Maw, proposing the health of The Association, regretted that they had failed to secure protection for their industry, but said that efforts were being made to secure an Order under the Merchandise Marks Act for the marking of all imported surgical instruments with the country of origin. Mr. Rowntree said that British surgical instruments were the best in the world; not only were they the best, but they were works of art which could compare with the artistic products of the forge and bench in any walk of life. Mr. Ferris-Scott remarked on the enormous debt which the medical profession owed to the surgical instrument makers of this country.

CONGRESS OF HYDROLOGY AT LYONS.—The Twelfth International Congress of Hydrology, Climatology, and Medical Geology was held at Lyons from Oct. 4th–12th. Large numbers of medical men, chiefly from France, took part in the proceedings. At the closing session, over which Mr. Herriot, Minister of Public Instruction and Mayor of Lyons, presided, Dr. Fortescue Fox, representing the British Government, referred to the English reputation for insularity and affirmed that it was now impossible for any country to live for itself alone. In science, at any rate, the English were internationalists. The branch of medicine with which the Congress was concerned was in a strange position, because, although it was the most ancient part of medical treatment, although it was widespread in all countries, although generations had proved its benefits, its intimate secrets had still to be discovered. The work of discovery had been begun, nowhere better than in France, but very much remained to establish the foundations of our knowledge and to make it generally available.

ROYAL VICTORIA HOSPITAL, BELFAST.—The present session opened on Oct. 14th, when an address was delivered by Mr. P. T. Crymble. Contrasting the mental outlook of the undergraduate and the graduate in medicine, he pointed out that the former had his course mapped out for him and a clear path to pursue, whereas the latter had various possibilities before him. General practice offered the easiest alternative, with a fair prospect of an early competence and the possibility of marriage. Specialism usually involved a long waiting period, but a higher qualification than that of M.B. was often advisable. The Services offered to many an attractive prospect—an immediate good income, a pension, and good social position—but it should not be overlooked that an income satisfactory to a single man of 24 was very inadequate for a married man of 45. He advised all his hearers to specialise to some extent upon some department of practice. One practitioner might become an expert radiographer, another might concentrate upon the digestive tract, another upon clinical bacteriology, another upon obstetrics. Even if they did not definitely specialise in such subjects their standards would be raised to a higher level. Mr. Crymble's address was enlivened by many happy strokes of wit, and was much enjoyed by the large audience. A cordial vote of thanks was passed to the lecturer on the motion of Colonel Andrew Fullerton, seconded by Dr. J. S. Morrow.

ROYAL NATIONAL ORTHOPÆDIC HOSPITAL.—On the ground that the constantly increasing work and scope of this institution require the services of a younger and more active man, the Earl of Denbigh has resigned the chairmanship, which he has held for a quarter of a century.

MANCHESTER AND SALFORD SKIN HOSPITAL.—The Norris Midwood Memorial Wing of this institution, which has cost £14,000, was opened last week. The extension, which contains a new X ray department, rooms for treatment by artificial sunlight, and additional acommodation for nurses, increases the number of beds to 50. The wing is a memorial to the late Mr. Norris Midwood, who was long a member of the board.

MEDICAL MAYORS.—Dr. George Brown Hillman, who has been elected Mayor of Wakefield, was educated at the Leeds School of Medicine and has practised in the West Riding for 35 years. A member of the West Riding County Council, he also serves on the West Riding and Wakefield Insurance Committees, the East and West Riding Voluntary Hospitals Committee, and other public bodies. As chairman of the Medical Propaganda Subcommittee of the Yorkshire Council of the British Empire Cancer campaign he has become well known throughout the country for industry and enthusiasm.—Dr. Arthur Hastings Bostock has accepted the unanimous invitation of the Chichester City Council to serve as mayor during the coming year. His father, the late Dr. A. S. Bostock, was mayor of Chichester in 1885, 1886, and 1891.

MR. CHAMBERLAIN ON HOSPITAL POLICY.—Mr. Neville Chamberlain, the Minister of Health, has issued a statement upon his hospital policy, in which he once more points out the danger to the voluntary system of lack of coöperation with other types of hospital. While there are thousands of empty beds in Poor-law hospitals, every voluntary institution has a waiting-list. "In the name of common sense, hospital accommodation should be treated as a whole so that there should be no waste." If the Poor-law institutions became municipal hospitals the stigma of pauperism would be removed and it would then not be difficult to form some joint body, representing both types, which should decide upon the need of extension, the direction in which it is needed, and the place where it should be provided. In this way the existing accommodation would be used to the utmost extent by the interchange both of patients and staff.—The Scottish Regional Committee of the British Hospitals Association is asking the Secretary for Scotland to receive a deputation with a view to ascertaining the policy of the Government in connexion with the proposed new Poor-law legislation for Scotland so far as it affects the voluntary hospital system.

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

MONDAY, Oct. 24th.—8 P.M., ODONTOLOGY. Presidential Address by Mr. W. Rushton. Paper: Mr. F. N. Doubleday: Chronic Fuso-spirillary Infection of the Periodontal Membrane and its Treatment.

TUESDAY.—5 P.M., MEDICINE. Paper: Dr. Vincent Lyon (Philadelphia): The Technique and Usefulness of Medical Biliary Drainage in Gall Tract Disease. (Illustrated with lantern slides and moving picture film.)

WEDNESDAY.—5 P.M., COMPARATIVE MEDICINE. Paper: Prof. O. Charnock Bradley: What is Comparative Medicine?

THURSDAY.—8.30 P.M., UROLOGY. Presidential Address: Mr. Frank Kidd: Purpura of the Urinary Tract.

FRIDAY.—5 P.M., DISEASE IN CHILDREN. (Cases at 4.30 P.M.) Dr. J. D. Rolleston: Hemiplegia following Scarlet Fever. Dr. E. A. Cockayne: Renal Dwarfism. Dr. W. M. Feldman: Pointing Empyema and Tuberculous Rib. Prof. Dible and Dr. Chodak Gregory: Specimen of Adenomatous Hypertrophy of Kidney. Other cases will be shown. 8 P.M., EPIDEMIOLOGY. Paper: Dr. E. W. Goodall: The Epidemic Constitution.

MEDICO-LEGAL SOCIETY, 11, Chandos-street, W.

THURSDAY, Oct. 27th.—8.30 P.M., Sir W. H. Willcox: Recent Advances in Toxicology and Forensic Medicine (Presidential Address).

MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, W.

MONDAY, Oct. 24th.—8.30 P.M., Dr. B. B. Vincent Lyon, U.S.A., will introduce a discussion on the Development of the Duodenal Tube and its Practical Value in Diagnosis and Treatment.

ST. JOHN'S HOSPITAL DERMATOLOGICAL SOCIETY, St. John's Hospital for Diseases of the Skin, 49, Leicester-square, W.C.
WEDNESDAY, Oct. 26th.—4.15 P.M., clinical cases and discussion on Pemphigus, to be opened by Dr. J. E. M. Wigley.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.
MONDAY, Oct. 24th, to SATURDAY, Oct. 29th.—FELLOWSHIP OF MEDICINE. Special lecture at the Medical Society, 11, Chandos-street, W., Mon., 5 P.M., Mr. Herbert J. Paterson: Surgical Hints.—ROYAL NORTHERN HOSPITAL, Holloway-road, N. Special surgical demonstration by Mr. J. B. Hunter at 2 P.M. on Mon. Special medical demonstration by Dr. Bruce Williamson at 3 P.M. on Tues.—CENTRAL LONDON OPHTHALMIC HOSPITAL, Judd-street, W.C. Special ophthalmic demonstration by Mr. Cunningham at 4 P.M. on Thurs. (The above are open to the medical profession without fee.)—ROYAL EYE HOSPITAL, St. George's Circus, S.E. Series of demonstrations on the Diagnosis and Treatment of Diseases of the Eye by members of the staff in the afternoons at 3 P.M. Mon. to Fri.—PADDINGTON GREEN CHILDREN'S HOSPITAL AND VICTORIA HOSPITAL FOR CHILDREN. Combined course in Diseases of Children, occupying all day. Sessions at each hospital alternately.—CHELSEA HOSPITAL FOR WOMEN, Arthur-street, S.W. Course in Gynæcology. Operations and lectures daily.—THE NATIONAL HOSPITAL, Queen-square, W.C. Special two months' course in Neurology. Further information from the Secretary, Mayfair 2236.

WEST LONDON HOSPITAL, POST-GRADUATE COLLEGE, Hammersmith, W.
MONDAY, Oct. 24th.—11 A.M., Mr. Tyrrell Gray: Surgical Wards. 2 P.M., Mr. Armour: Operations. 4.30 P.M., Mr. Addison: Appendicitis (lecture).
TUESDAY.—10 A.M., Medical Registrar: Ward Demonstration. 2 P.M., Mr. Sinclair: Surgical Out-patients. 4.30 P.M., Dr. Shaw: Emphysema.
WEDNESDAY.—10 A.M., Dr. Owen: Medical Diseases of Children. 10 A.M., Dr. Burnford: Medical Wards.
THURSDAY.—10 A.M., Dr. Grainger Stewart: Neurological Department. 2 P.M., Dr. Ironside: Medical Out-patients. 3 P.M., Sir H. Simson: Gynæcological Ward.
FRIDAY.—10 A.M., Dr. Dowling: Skin Department. 2 P.M., Mr. Addison: Operations. 2 P.M., Dr. Shaw: Medical Out-patients.
SATURDAY.—9.30 A.M., Dr. Burnford: Bacterial Therapy and Ward List. 10 A.M., Dr. Owen: Medical Diseases of Children.
Operations, Medical, Surgical, and Special Out-patients, daily 10 A.M. to 5 P.M.: Saturdays, 10 A.M. to 1 P.M.

SOUTH-WEST LONDON POST-GRADUATE ASSOCIATION, St. James's Hospital, Ouseley-road, Balham, S.W.
THURSDAY, Oct. 27th.—4 P.M., Dr. Hector C. Cameron: Pneumococcal Infections in Childhood.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.
MONDAY, Oct. 24th.—2.30 P.M. to 5 P.M., Medical, Surgical, and Gynæcological Clinics. Operations.
TUESDAY.—2.30 P.M. to 5 P.M., Medical, Surgical, Throat, Nose, and Ear Clinics. Operations.
WEDNESDAY.—2.30 P.M. to 5 P.M., Medical, Skin, and Eye Clinics. Operations.
THURSDAY.—11.30 A.M., Dental Clinic. 2.30 P.M. to 5 P.M. Medical, Surgical, and Ear, Nose, and Throat Clinics. Operations.
FRIDAY.—10.30 A.M., Throat, Nose, and Ear Clinics, 2.30 P.M. to 5 P.M., Surgical, Medical, and Children's Diseases Clinics. Operations.
There will also be a special demonstration of ear, nose, and throat cases at 2 P.M. on Tues., Oct. 25th, and of surgical cases at 2 P.M. on Thurs., Oct. 27th, by Mr. W. Ibbotson and Mr. H. W. Carson respectively.

HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C.
THURSDAY, Oct. 27th.—4 P.M., Mr. Doyne: Corneal Ulceration.

ROYAL INSTITUTE OF PUBLIC HEALTH, 37, Russell-square, W.C.
WEDNESDAY, Oct. 26th.—4 P.M., Sir H. Gauvain: Tuberculosis as a Problem of Childhood.

LONDON SCHOOL OF DERMATOLOGY, St. John's Hospital, 49, Leicester-square, W.C.
TUESDAY, Oct. 25th.—5 P.M., Dr. H. W. Barber: Immunity and Anaphylaxis.
THURSDAY.—5 P.M., Dr. W. Griffith: Principles of Treatment. General.

PEOPLE'S LEAGUE OF HEALTH, 12, Stratford-place, W.
WEDNESDAY, Oct. 26th.—4 P.M., Prof. F. T. G. Hobday Some Diseases Conveyed to Man from Animals and their Prevention.

MANCHESTER ROYAL INFIRMARY POST-GRADUATE COURSE.
TUESDAY, Oct. 25th.—4.15 P.M., Dr. C. H. Melland: Some Medico-Legal Cases.
FRIDAY.—4.15 P.M., Dr. J. Gray Clegg: Microscopy of the Living Eye.

UNIVERSITY OF SHEFFIELD POST-GRADUATE CLINICS.
FRIDAY, Oct. 28th.—3.30 P.M., Mr. Hay: Clinical Cases.

Appointments.

GORDON, A. KNYVETT, M.B., B.Chir. Camb., has been appointed Hon. Consulting Pathologist to the Victoria Hospital, Swindon.
KISSEN, H.S., M.B., Ch.B. Edin., Outdoor Medical Officer for the Springburn District of Glasgow.
MACMILLAN, D., M.D. Edin., Junior Assistant Physician at Crichton Royal, Dumfries.
MOORE, D. L. H., M.B., B.Ch. Dub., Certifying Surgeon under the Factory and Workshop Acts for the Exmouth District of the County of Devon.

Vacancies.

For further information refer to the advertisement columns.
Bermondsey Guardians, Ladywell Poor-law Institution, Ladywell-road, Lewisham, S.E.—M.O. £400.
Bermondsey Guardians, Shirley Schools, Wickham-road, nr. Croydon.—Part-time M.O. £350.
Birmingham and Midland Eye Hospital.—Res. Surg. O. £150.
Birmingham, Witton Babies Hospital.—Res. M.O. £150.
Birmingham, Woodlands Open Air Orthopædic Hospital.—Jun. H.S. At rate of £150.
Bolingbroke Hospital, Wandsworth Common, S.W.—H.P. At rate of £120.
Brighton, Royal Alexandra Hospital for Sick Children.—H.S. At rate of £120. H.P. At rate of £100.
Bristol, Brunswick Maternity Hospital, Brunswick-square.—Asst. Phys.
Burton-on-Trent, Bretby Hall Orthopædic Hospital.—Res. M.O £450.
Cambridge, Addenbrooke's Hospital.—Hon. Asst. P. to Out-patient Dept.
Cancer Hospital, Fulham-road, S.W.—H.S. At rate of £100.
Central London Ophthalmic Hospital, Judd-street, W.C.—Asst. Surg.
Colindale Hospital, Hendon.—Jun. Asst. M.O. £500.
Croydon General Hospital.—Cas. H.S. £125.
Derby, Derbyshire Royal Infirmary.—Ophth. H.S. £150.
Dumfries, Crichton Royal Mental Hospital.—Clin. Pathologist. £400.
Edinburgh Royal Infirmary, Eye Dept.—Sen. Clin. Asst., &c. £145.
Hospital of St. John and St. Elizabeth, 40, Grove End-road, N.W. Asst. S.
Liverpool City.—Medical Visitor under Lunacy Act.
Metropolitan Ear, Nose, and Throat Hospital, Fitzroy-square, W. H.S. £150. Also Anæsthetist.
Newark Hospital and Dispensary.—Res. H.S. At rate of £150.
Ovamboland, South-West Africa.—District S. £1000.
Portsmouth, St. Mary's Infirmary, &c.—Third Asst. Res. M.O. £250.
Royal London Ophthalmic Hospital, City-road, E.C.—Pathologist and Curator. £200. Also Dental Surg.
Royal Waterloo Hospital for Children and Women, Waterloo-road, S.E.—H.S. At rate of £100. Also Asst. Radiologist. £50.
St. Leonard's Hospital, Shoreditch.—Asst. M.O. £350.
Salford City.—Asst. Maternity and Child Welfare M.O. £600.
South Wales Sanatorium, Talgarth, Breconshire.—Res. M.O. £350.
Swansea Hospital.—H.S. to Ophth. and Aural Depts. £150–£200.
Swindon, Wilts, Victoria Hospital.—Res. M.O. At rate of £100.
University College Hospital, Gower-street, W.C.—Asst. Radiologist. £200.
University of London.—Associate Examiners.
Wallingford, Berks Isolation Hospital.—M.O. £15 15*s.* and £1 10*s.* per case admitted to Hospital.
Willesden, General Hospital, Harlesden-road, N.W.—P. in charge of Dept. for Dis. of Skin.
Wolverhampton and Staffordshire Hospital.—Hon. Fracture and Orthopædic S.
The Chief Inspector of Factories announces a vacant appointment for a Certifying Factory Surgeon at Snodland (Kent).

Births, Marriages, and Deaths.

BIRTHS.

DUNCANSON.—On Oct. 11th, at Braxted-park, Streatham, S.W., the wife of Dr. J. Gray Duncanson, of a daughter.
MATSON.—On Oct. 13th, at Woking, the wife (*née* Viveash) of Robert C. Matson, M.R.C.S., L.R.C.P., Captain, R.A.M.C. (retd.), of Fir Ridge, Hook Heath, Woking—a son.
SLEIGH.—On Oct. 11th, the wife of Dr. J. C. Sleigh, Albany Cottage, Dedham, of a daughter.

DEATHS.

BRIDGES.—On Oct. 6th, at 2, Courtfield-road, S.W., Helen Constance (*née* Scott), the devoted wife of E. Chittenden Bridges, M.D.
DOWN.—On Oct. 14th, at 9, The Crescent, Plymouth, Edith Monica Down, M.B., B.S., eldest daughter of Dr. and Mrs. Elgar Down.
MACPHERSON.—On Oct. 15th, at Evelyn-gardens, S.W., Major-General Sir William Grant Macpherson, K.C.M.G., C.B., LL.D., aged 69.

*N.B.—A fee of 7*s.* 6*d.* is charged for the insertion of Notices of Births, Marriages, and Deaths.*

Notes, Comments, and Abstracts.

THE PHYSIOLOGICAL BASIS OF THE MINIMUM WAGE.*

BY V. H. MOTTRAM, M.A. CAMB.,

PROFESSOR OF PHYSIOLOGY IN THE UNIVERSITY OF LONDON, AND HEAD OF THE PHYSIOLOGY LABORATORY, KING'S COLLEGE FOR WOMEN (HOUSEHOLD AND SOCIAL SCIENCE DEPARTMENT).

AT first sight the task of calculating the cost of living at a subsistence level appears simple. The amount disbursed for food in the working-class household varies from about 50 per cent. of the total income to 66 per cent., or even higher. As the income decreases the proportion which goes on food rises, till it reaches its highest level among the very poorest.[1] If the physiologist can calculate the minimum cost of a theoretically sufficient diet—one which yields sufficient calories, protein (both first-class and otherwise), fat, carbohydrates, salts, roughage, and vitamins A, B, C, D, and E—he has given a figure for by far the largest portion of the cost of subsistence. With the help of the economists, it should not be difficult to calculate the cost of the remaining moiety of expenses. The sum of the two would give the cost of subsistence—a cost upon which the minimum wage surely must be based.

Minimum Cost of Subsistence.

It is quite easy to calculate the minimum cost of a theoretically sufficient diet, and I imagine that economists, in collaboration with physiologists and medical men, would have little trouble in calculating the minimal cost of adequate heating, lighting, shelter, and clothing. The sum is the minimal cost of subsistence. But this is exactly where the trouble begins. Apart from the fact that it is debatable whether a minimum wage should ever be allowed to sink so low as the minimal cost of subsistence, and whether the individual or the family should count as the unit, it is clear that, while the armchair physiologist and economist may be able to calculate a theoretical minimum subsistence cost, it is the community which will have to decide whether their conclusions are just and practicable. Psychology invades the problem, for man is no Robot, whom you can stoke with the same monotonous fare day after day. He demands some modicum of variety.

Here, for example, is an attempt to calculate a subsistence level diet.[2] It contains 7¼ oz. of fresh herrings, 1 lb. 7 oz. of oatmeal, and 4 oz. cabbage per day. This diet is obtained by taking the cheapest source of animal protein (fresh herrings) and providing enough to give 30 g. per day. Then the remainder of the day's calorie needs is supplied by the cheapest source of calories (oatmeal), and 4 oz. of cabbage added to supply vitamin C. Theoretically this diet would yield over 3000 great calories, 100 g. of protein—30 per cent. of this being first-class protein—reasonable proportions of fat and carbohydrate (74 : 459), and vitamins A, B, C, D, and E. The cost of this diet is about 6*d.* per day, or, accurately, 3*s.* 4½*d.* per week. This is the lowest conceivable diet upon which subsistence with efficiency is possible.

But, of course, such a subsistence diet is impossible. No one could swallow 1¼ lb. of oatmeal a day, nor tolerate the monotony of the diet, even supposing he had the physiological knowledge to purchase such a diet and the practical knowledge of how to cook and serve it so that it were not revolting. One thing which has become abundantly clear in physiological research is that appetite,[3] as apart from hunger, has much to do with the proper digestion, assimilation, and utilisation of food. The physiological engines of the body are guided partly by the psychological condition of their owner. Consequently no subsistence diet, however admirable from the theoretical point of view, such as the one given, can be accepted as practical.

Calculation from pre-War Data.

The next method of approximating to the cost of a practical minimum food expenditure is to take diets which in the past have been considered to be sufficient, based on investigation into the way in which the working classes live. It is obvious that you must respect their traditions, and, if necessary, develop or modify them by education as much as is possible. It is no use trying to impose a diet foreign to their traditions from without.

This has been done in the past by many investigators and more notably by Rowntree,[4] who has published data of suggested minimal diets for the working class. These data have been accepted, if not for practice, at any rate as a basis of discussion. The latest figures he gives are for 1914, and the cost of his dietary works out at about those of convicts and inmates of workhouses at the prevailing rates at the time when the estimates were made. We might take these figures and multiply them by an index to represent the rise in the cost of food and take the result (approximately 7*s.* 6*d.* per week) to represent the cost of a subsistence diet for an adult male—not, of course, a theoretical subsistence diet, but a diet upon which it is not wise to economise.

Unfortunately much has happened in the world of dietetics since 1914. Consequently it has seemed better to recalculate from the beginning so that the newer knowledge of the vitamins, the importance of first-class protein and of mineral matter and roughage, and the value of the imponderables in dietetics, such as flavour, service, and personal likes and dislikes as regards food, should be given due weight.

Calculation from Modern Data.

Let us make the assumption that an adult male needs from 3000 to 3500 great calories per day, which are to be obtained from the combustion of about 100 g. of protein (30 per cent. of which must be first-class protein), 50 to 100 g. of fat, and of 400 to 500 g. of carbohydrate. Further, let us assume that this dietary must contain vitamins A, B, C, D, and E, some roughage and mineral matter—e.g., iron, phosphorus, calcium, chlorine, and iodine. Most investigators would agree that such a diet is adequate, though no satisfactory estimates exist of the necessary amounts of vitamin-containing foods. In addition, the diet must be varied and palatable, and not depart markedly from what is acceptable to a working-class community.

Below is an attempt to construct a cheap and satisfactory dietary which will satisfy the criterions we have adopted above. It was obtained in the following way. The late Sir William Bayliss's[5] aphorism, "Take care of the calories and the proteins will take care of themselves," is roughly true and served as the starting-point. It was assumed that it would be possible to discover an adequate diet, costing on the average about 3*d.* per 1000 calories. (Agricultural labourers in Essex manage on 3·3*d.* per 1000.) Foods were ranged in the order of their cost per 1000 calories, and the main bulk of the diet chosen from those foods, the cost of which was 6*d.* per 1000 or under. These included haricot beans, white flour, wholemeal, oatmeal, white and brown breads, vegetable and animal margarine, macaroni and spaghetti, dried peas, sago, sugar, dates, tapioca, currants, figs, potatoes, suet, treacle, neck of (imported) mutton. From inspection of this list it was clear that while it would be easy to obtain the calories, it would not be easy to get variety, first-class protein and the vitamins, particularly A, C, and D. Consequently, therefore, there was added to it fresh herrings (for first-class protein and vitamins A and D), cheese (first-class proteins, vitamins A and (?) D), cabbage, tomato, lemon, lettuce or watercress (to supply vitamin C, mineral salts and roughage), beef and bacon (to give variety) and milk. Cocoa and tea were adopted as beverages.

From such a list of foods my colleague, Miss Jessie Lindsay, who is in charge of the Household Work Department of this College, aided by Miss Tress, worked out a series of menus for a week which, when analysed, gave: 12 oz. meat, 2¾ pints of milk, 8¾ oz. sugar, 14¼ oz. treacle, 8¾ lb. of bread and flour, 4 oz. cheese, 8 oz. margarine, 3¼ lb. of potatoes, 1 lb. 5 oz. fresh fruit and vegetables, 13¼ oz. suet and dripping, 14¼ oz. oatmeal, macaroni, &c., 1 oz. cocoa, ¼ lb. tea, 1 lb. herrings, 1¼ lb. of dried fruit, and 9 oz. pulses.

These figures closely approximate to the distribution of foodstuffs found in actual use by A. B. Hill, by Rowntree, and by the 1918 Agricultural Wages Board Inquiry.[6] The meat is slightly reduced below Hill's and Rowntree's estimates, and considerably below the Wages Board Inquiry, while the milk is increased and the fish, fats, cereal products, and dried fruits largely increased. This has been done to obtain the benefit of the protein and calorigenic value of milk,[7] the protein and vitamin A and D values of herrings, and the high calorigenic values of the cereals and the dried fruits.

When this dietary is analysed for proteins, fats, carbohydrates and calories the yield is, per day, approximately 94 g. of protein (of which 29 g. is first-class protein), 115 g. of fat, 545 g. of carbohydrate, and 3350 great calories. Vitamins A and D are represented in the meat, the herrings, the suet, the milk, and probably in the dripping; vitamin B in the oatmeal, bread and vegetables; and vitamin C in the tomato, lemon, and potatoes.

Such a diet as regards proteins is about adequate, while in fat, carbohydrate, and calories it is adequate. As regards vitamin C, perhaps it is adequate (one tomato, one lemon, and ¼ lb. cabbage per week). Its cost, at the lowest prices prevailing at the moment, is 6*s.* 3*d.* [These figures are for London, October, 1927.]

A Reasonable Dietary.

Of course, the dietary would not suit all tastes. It is a north country rather than a south country diet, both in

* Introducing a discussion at the Conference on Family Endowment, Oct. 15th, 1927.

the types of food used—e.g., oatmeal—and in the amount of cooking required. It would not be easy to cook it on a gas-ring shared by one or two other families. Further, some of the dishes to be prepared—e.g., macaroni cheese—are not popular in the working-class quarter in which inquiries have been made, and some foods, such as dried fruits, though popular, are not consumed in the quantities suggested. Unfortunately, almost any alteration to meet such prejudices would at once raise the cost, excepting a diminution of the dried fruits and the substitution for them of other foods. Oatmeal and macaroni are among the cheapest sources of calories, so that substituting them by anything but bread and margarine would raise the price and decrease the variety; while cutting down the dried fruit would have the disadvantage of loss of flavour from a dietary which tends to monotony. Other cheap cuts of meat—e.g., neck of mutton, flank of beef—could be substituted for the cut used (shoulder steak) with no loss in economy.

Apart from these criticisms, which more reasonable housing and education might remove, the dietary is a reasonable one; it has variety; it provides the requisites and departs but little from foods actually in use among the labouring classes. Its price tallies with that of the most economical and at the same time efficient diet which we have met: one among the 98 family budgets investigated by A. B. Hill.[4] (The actual figures of these budgets are not given in the communication referred to, but may be obtained through the courtesy of the editor of the *Journal of Hygiene*.) Among these 98 families there are eight whose expenditure on food is successful in obtaining an adequate diet. The prices paid for food per "man value" had a large range—i.e., from 6*s.* 3*d.* to 12*s.* 1*d.* It will be noted that one family was able—even though its man value was 4·86—to obtain a diet at the same figure as the one we suggest. The next above works out at 7*s.* per man value.

We may assume, therefore, that with skilful purchasing in the cheapest market, based either on a long experience or on a knowledge of dietetics, a dietary can be obtained at so low a cost as 6*s.* 3*d.* per week per adult male, so long as the occupation followed is not a very strenuous one. Below such an expenditure it is unlikely that bodily efficiency could be purchased. This sum, therefore, sets the limit from which we may proceed to estimate what minimal subsistence will cost. It must be realised, however: (1) that this figure was arrived at when food prices were low, and that any attempt to put it into practice must allow for fluctuations in the prices of foods; and (2) that it demands skill in laying out of money which only one or two housewives in a hundred appear to have. Although this figure is used throughout the rest of the discussion, my own prejudice is in favour of raising it to 7*s.* per week.

Relation of Food to Total Expenditure.

The next step is to assess what relation the money spent on food should bear to the total income. It is tempting to the physiologist to say that we ought to be able to discover the cost, at present conditions of housing, &c., in any district, of the minimum of light, air, warmth, and clothing which hygiene demands, and thus give an estimate of the cost of subsistence based entirely on physiological principles. By adding the cost of the minimal requirements of light, air, heating, and clothing to the cost of the minimal requirements of food we get the cost of subsistence with efficiency. For the present, however, it may be doubted whether this is feasible, partly because one has a shrewd suspicion that the housing accommodation to meet the demands of hygiene simply does not exist.

The utmost that can be done is to multiply the cost of the minimal dietary by a definite factor, based on the average relation of the money spent as food to the total income. In actual investigations the figure runs from about 50 per cent. to 75 per cent. As was said in the opening sentences, the lower percentage is found among those whose wage is relatively good, while the higher percentage is found among the poorest. A. B. Hill's figures for the whole of the families investigated average at 68·8 per cent. We might take, as has been done in the past, a factor such as 66·7 per cent. This is sufficiently close to Hill's actual findings and to the findings of many other investigators in the past. This would bring the minimum subsistence figure to 6*s.* 3*d.* $\times \frac{3}{2}$ or to 9*s.* 4½*d.*

The obvious criticism of this method is that though by careful scientific discussion of a dietary, expenditure on it can be cut down without detriment to health, the amount to be spent on rent, clothing, light, and heat is not capable of such reduction. No amount of consideration will cut down the price of oil and coals. Consequently to multiply the cost of a minimal efficient diet by 150 per cent. and say that that figure should indicate the cost of subsistence is manifestly unfair. We are left with the unsatisfactory method of making a guess, though it be a guess based on definite facts. My guess is that it will be fair to assume that the food budget, reduced as it is by scientific considerations to its lowest limit, should represent 60 per cent. of the expenditure for subsistence. This gives an estimate of 10*s.* 5*d.* as the lower limit of the cost of living for the adult male. If the higher figure of 7*s.* a week for food be adopted, the basic minimum becomes 11*s.* 8*d.*

This figure is provisional only. It is based on assumptions which may turn out to be untrue. It must be increased if longer hours per day are worked, or more arduous work undertaken. It must vary with the varying levels of prices. It will alter from place to place and time to time, and it will be affected by what the public conscience demands in the way of housing, lighting, heating, sanitation, &c.

The figure, 10*s.* 5*d.* (or, if we take the more cautious estimate, 11*s.* 8*d.*), is the basic figure for the adult male. The problem arises: what of the wife and children of the adult male? As long as the unit in the country is supposed to be the family and not the individual, so long must the basic minimum be raised from its adult male value to the value equivalent to a family expressed as adult males. Thus a family of father, mother, and one child under 6 counts as 1 + 0·83 + 0·5 adult males = 2·33.

A Statistical Fiction.

There is a fiction of a "standard family" which consists of father, mother, and three children, and is supposed to be approximately equivalent to four adult males. For such a family the income per week should not fall below 4 × 10*s.* 5*d.*, or 41*s.* 8*d.*

The "standard family" is not even a convenient abstraction, for in no way does it correspond to reality. In the Essex budgets[4] the man value of the family (on a rather low standard of estimation[5]) was on the average of 98 families as high as 4·9, instead of the "standard family" of 4. Of the 63 families receiving less than the average income per "man," six only had "standard families"; the rest had larger families. No family obtained a diet which the physiologist would pass as adequate. Of 35 families receiving more than the average wage per man, 27 were below the physiological minimum, while only eight exceeded it. Six of these successful families counted for much less than the "standard family"—1·83 to 3·23—and one of the two families of more than standard size was living rent free. It is fairly clear from consideration of even these figures only that the standard family is a myth, and that a large family usually coincides with poor living. (Incidentally the almost complete inability of this group of families to obtain satisfactory food on an income per man value averaging 8*s.* 0½*d.* is evidence that the figure we have chosen—viz., 10*s.* 5*d.*—is no wild Utopian figure.)

Summary.

Any attempt to calculate from physiological principles the minimum wage which should be paid on the assumption that the family is the unit, must take into account the size of the family. The needs of the family—more particularly their food needs—vary with the size of the family. Whether it is feasible to adjust a minimum wage so that it is adapted to the size of each individual family, and if feasible, whether right and proper, are questions into which economists and politicians must probe and the electorate settle. The following statements summarise the position so far as it concerns the physiologist:—

1. A basic minimum diet for an adult male costs at the present time, and in the cheapest London markets, at least 6*s.* 3*d.* per week.

2. If we assume that 60 per cent. of the income of a person at subsistence level should go on food, the minimal expenditure per week per adult male should not go below 10*s.* 5*d.* The actual figure must vary with market fluctuations of price.

3. Should we proceed to calculate a minimum wage on the assumption that each male wage-earner is the head of a standard family equal to four adults, we should fix such wage at 41*s.* 8*d.* per week. As, however, the standard family is a myth, and the assumption of its existence would push many families below the poverty line, any calculation of a minimum wage based on physiological principles must take into account the man value of each individual family.

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FOOD POISONING.

THE MALCOLM MORRIS MEMORIAL LECTURE.

THE lecture was delivered this year, by arrangement with the Chadwick trustees, at the B.M.A. House, Tavistock-square, on Oct. 17th, when Dr. W. G. SAVAGE (M.O.H. for Somerset) dealt with the subject of Food Poisoning. Sir WILLIAM COLLINS presided.

Food poisoning, Dr. Savage said, had been a question of considerable interest from the earliest days, though of late years, owing to the greater variety of foods, it had assumed a different form. The necessity for conserving food for long periods and the desire of the public to have its palate tickled with food made in different ways had helped to keep up the amount of food poisoning, despite the efforts continually being made to improve public health. The simplest type of food poisoning was that caused by a definitely poisoned animal or plant having been consumed. In this country there was not much illness caused by eating poisoned animals, but mushroom and other forms of poisoning were fairly common. A fairly simple kind was that by chemical substances which had been accidentally introduced into food, such as apples which had been sprayed with an arsenical compound. In 1922 200 people suffered from poisoning which was traced to apples having been cooked for some hours in a zinc container, the acid having dissolved sufficient of the zinc to produce the poison. Recently four members of a family partook of breast of mutton and afterwards suffered from belladonna poisoning. It was found that mixed with the sage for the stuffing were some belladonna leaves. Outbreaks of chemical poisoning, however, constituted but a very small part of the whole. Most were due to bacteria. Seventeen persons who partook of some brawn were ill, and three died, and it was discovered that the pig in question had suffered so badly from a diseased leg that it could not be walked to market. Three of the patients had eaten only the vegetables which were cooked in the same vessel.

Ptomaine Poisoning a Misnomer.

Dr. Savage said a good deal of misconception prevailed concerning ptomaine poisoning. It arose from the idea that the cause of the illness was the fact that the food was tainted or decomposed. Ptomaine poisoning was really a misnomer. Certain chemists, working on the subject, allowed food to putrefy to an objectionable degree, and were able to extract from it chemical substances, to which they gave the general name ptomaines. When these were injected (as opposed to fed) into animals violent symptoms ensued, and this was held to prove that decomposed food caused, when ingested, the poisoning known as ptomaine poisoning. Ptomaines, however, it was now clear, had nothing to do with the problem at all. In most cases of food poisoning the food itself was perfectly good physically, but poisonous bacilli had gained access to it without causing any naked-eye changes, nor alterations in the smell or taste. Many food-poisoning outbreaks were conveyed by such food as fruits which did not decompose. Usually the contamination of foods could be traced to the handling they received in dirty and unwholesome surroundings before the consumer received them. At least three-fourths of the outbreaks of food poisoning in this country were due to bacilli of the Salmonella group. Concerning this group, three points were important: (1) they multiplied with great rapidity in food, particularly during hot weather; (2) during their growth on food they did not produce in it physical changes which were discernible to the unaided eye; (3) they produced toxins in the process of growth which were very irritant. In rabbits extreme irritation of the stomach wall was evident within six hours of eating the food so contaminated. These food cases occurred at all times of the year, but, naturally, most in the hottest months, the upward curve usually commencing in April.

The Kinds of Food-Vehicle.

With regard to the kinds of food which acted as the vehicles for the Salmonella bacteria, he had been through the details of 200 outbreaks, and worked out the percentages. Thirty per cent. were due to the eating of canned foods; 7 per cent. milk, 8 per cent. milk products (mostly ice-cream and cheese), 27 per cent. made-up meats, 4 per cent. manipulated food like stuffed meat, 16 per cent. in fresh meat, 4 per cent. fruit or vegetables, 3 per cent. other foods not here mentioned. In no less than 72 per cent. the poisoning was traced to foods which had been man-handled in some way—canned foods, sausages, brawn, "faggots," chopped meat. Many of the incriminated foods were those which, having been mixed, were heated and allowed gradually to cool, brawn and ice-cream forming a large class in these. It was most probable that the contamination took place during the cooling if the surroundings were dirty and dusty. While the material was hot, any bacilli alighting on it would probably be killed off, but at subsequent stages in the cooling the temperature would be congenial, and rapid multiplication would occur. An outbreak in 1923, in which many hundreds of people were ill—though only one died—was traced to ice-cream having cooled in a filthy place, and been sold through the streets from three hand barrows. Salmonella bacilli were isolated. A very important feature about Salmonella bacilli was that, alone among microbes, their toxin was heat-resisting. The toxin could be boiled for an hour or more and yet its lethal character was not disturbed.

The cases of poisoning due to the eating of canned meat were of exactly similar character; their incubation period was short—i.e., two to four hours—and the symptoms were acute vomiting, diarrhœa, and acute abdominal pain. The acuteness, however, seldom lasted more than 24 hours, and the deaths from it were very few. When a fatal result ensued the person was usually already the subject of some disease such as diabetes. The mere distension of a tin containing food was not a sure indication of the presence in it of poisonous gases.

Attacks of botulism were quite infrequent in this country, but not so rare in the United States. Still, at Loch Maree (Ross-shire) a bad outbreak of botulism occurred in 1922. Eight people started on a fishing expedition equipped with sandwiches containing wild duck paste preserved in glass jars. Some time after eating them the members of the party suffered from symptoms in nerves, eye, and throat, and examination of scraps remaining in a glass jar revealed the *B. botulinus*. The disease was well known in Germany, and in Russia was said to be on the increase, due there principally to fish. In the United States it was chiefly traced to preserved fish and olives, and the profession there energetically set to work to trace the disease to its sources and stamp it out.

The Question of Prevention.

With regard to the important subject of prevention, it was now clear that the Salmonella bacilli were not normal denizens of the human intestine, but they had been found in diseased animals, therefore outbreaks might start from the eating of the flesh of diseased animals. In Germany, where the system of meat-inspection was closer than ours, it had been definitely proved that botulism could arise from drinking the milk of a diseased cow. It was not likely to be spread by human carriers. *B. botulinus* occurred in the soil. The main preventive, of course, was careful attention to sterilisation and the prevention of dust infection. It was essential to try to hunt out the reservoirs of the offending bacilli and destroy them, as in the case of the anopheles in malaria; and the heat needed to destroy any bacilli without prejudicing the nutritive value of the food must be ascertained. Scrupulous cleanliness could not be too much insisted on. Section 12 of the Regulations applying to slaughter-houses was of much importance, seeing that it prohibited the carrying on of any process in those places, such, for instance, as the making of tripe, sausages, and pickling meat. Rats and mice must be exterminated from the surroundings of food preparation. He did not think the legislature exercised sufficient control over the preparation and manufacture of made-up foods; there was, he contended, urgent need for the registration of premises where such processes were carried out, with periodic inspection, carrying with it the power to close such as were not satisfactory. In a general way he would say it was unwise to eat made-up food of which one knew nothing, especially bearing in mind that in most cases contaminated food did not carry on its face any evidence of the fact. Unfortunately there was still a good deal of misconception on the subject. Dr. Savage hoped that one result of this popular lecture would be an increased willingness on the part of the lay public to help medical officers and others in the good work for the community in which they were engaged.

TREATMENT OF PSORIASIS WITH THYMUS.

ANY success claimed in the treatment of psoriasis deserves careful investigation. In the *Medical Journal and Record* of August 17th Dr. F. F. Ward, of New York, recommends hypodermic injections of thymus, a suggestion doubtless springing originally from the work of Brock, of Hamburg, who has reported on the effect of irradiating the thymus for this disease. The claims which Brock has put forward have not been confirmed by the experience of other workers; those now advanced by Dr. Ward can easily be put to the test, for preparations of thymus gland for subcutaneous or intramuscular injection are on the English market. Dr. Ward used a preparation made by Harrower, and injected 1 c.cm. into the buttock three times weekly. Benefit was observed in a month, and cure was complete in his first case in six months. In only one case did the treatment fail, and it is affirmed that no local or general reactions need be feared, but the number of cases is not stated, and the question of relapse is not discussed. Every dermatologist knows that injection of a staphylococcus vaccine, a mixed *Bacillus coli* vaccine, boiled milk, and many other foreign proteins will temporarily cause involution of psoriasis lesions in some cases, though these effects are extremely uncertain.